

Machine and Tool **BLUE BOOK**

SERVING THE METAL WORKING INDUSTRY SINCE 1906

JANUARY 1950 THIS MONTH

How's Business

Economic Forecast for 1950

Uses and Applications of Automatic

Screw Machines

Power Chucking to Reduce Costs

Holding Cylindrical Components

Foremanship Forum

Modern Tools in Action

Prof. Reichardt's Quiz

Letter from England

What's New in Metalworking

Available Literature

Advertisers' Products Index

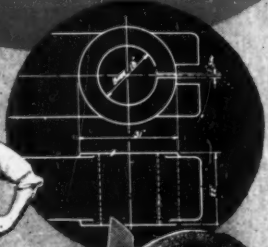
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COMPLETE INDEX ON PAGE 5

A HITCHCOCK PUBLICATION



This is another of the
"HUNDREDS OF JOBS"
which can be done on a
MARVEL Band Saw!



MARVEL BAND SAW saved these
two 4400 lb. castings

Two sand cores washed out when these giant 4400 pound steel connecting rods were cast, resulting in solid eye ends without gaps. Then came the \$64 question—how to machine out the 1½" slots in the longitudinal center of the eyes which were 22" high and had a wall thickness of 6½".

The Ernest J. Nelson Iron Works of San Francisco, did this "impossible" job easily, quickly and economically, without special tooling, on a standard Model No. 8M 2 MARVEL Band Saw. Two cuts were made in each rod in two hours per cut with tool cost of \$3.06 per rod. The tool was a MARVEL B9-10 Band Saw Blade.

Every tool room, machine shop and maintenance department needs a MARVEL Series 8 Universal Band Saw—not only for innumerable everyday jobs but for the occasional "trick" operations, where its utmost versatility will save many headaches and dollars.

WRITE FOR CATALOG



These exclusive MARVEL
features made this
job easy:

1. Large, T-slotted work table.
2. Blade feeds into work vertically; work always stationary.
3. Power-pressure feed.
4. Automatic blade tension.
5. Built-in coolant system.
6. Large capacity.

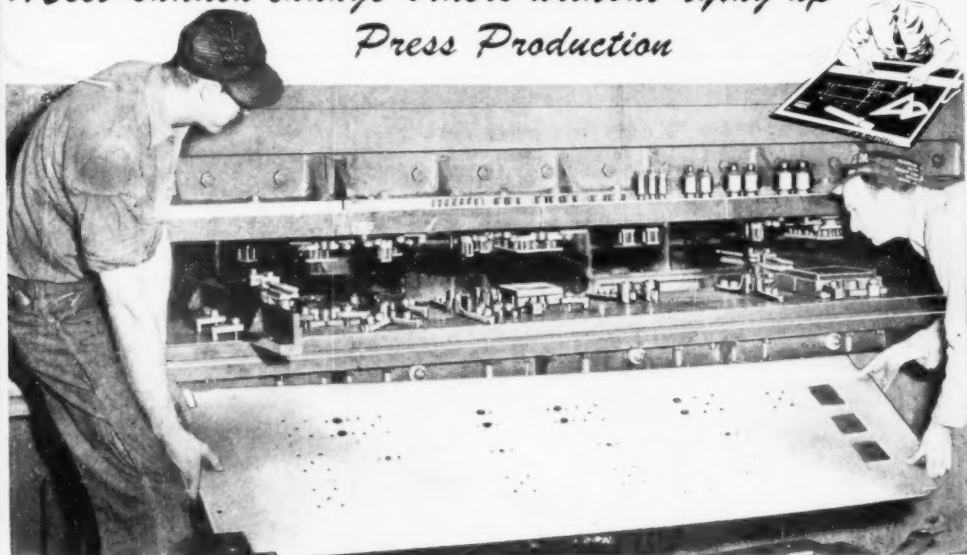
ARMSTRONG-BLUM MFG. CO.

5700 Bloomingdale Ave., Chicago 39, Illinois

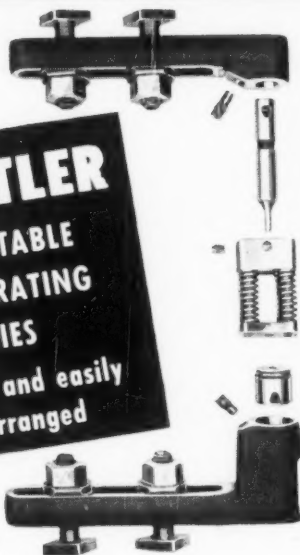


MARVEL *Metal Cutting*
SAWS
Better Machines—Better Blades

Meet sudden change-orders without tying up Press Production



WHISTLER
ADJUSTABLE
PERFORATING
DIES
quickly and easily
rearranged



Write

for the Whistler
Catalog today and
get all the facts.

Change-orders from the engineering department usually cause plenty of headaches in production...particularly where die piercing operations are involved.

But, if you're using Whistler Adjustable Dies, there is no lost time—no waiting—no extra die expense. The same dies are easy to rearrange to the new design. Add units from stock, or delete sizes and shapes no longer required. Arrange the new set-up right on the press.

Consider the savings in production time alone. Then think how continued re-use of the same dies in subsequent jobs writes off first cost.

Whistler Dies can be used in practically any press. All parts are interchangeable. Precision is assured on long or short runs. Closer centers permit fewer press operations.

Deliveries are quick...little or no waiting. Standard round punches and dies up to 3" are available from stock. Ovals, squares, rectangles and special shapes can be made up in a few days.

S. B. WHISTLER & SONS, INC.

760 Military Road • Buffalo 17, N. Y.

First public showing of Whistler Magnetic Dies at work — Booth 832 —
ASTE Convention — April 10 to 14 — Philadelphia

Extend the scope of lower-cost,
up-to-date production with the

Bridgeport

1 H.P. MILLING, DRILLING
AND BORING
ATTACHMENT



**A
NEW UNIT
for
HEAVY DUTY
NEEDS**

With the advent of this NEW "BRIDGEPORT" attachment, die, tool, mold and metal working shops of all kinds can modernize the handling of heavier work.

All the advantage in milling, drilling and boring the "Bridgeport Way", as demonstrated in the more than 11,000 universally popular standard Milling Attachments now in service, are made available in this heavy duty unit. Capacity, speed and convenience make past methods obsolete and assure higher production at lower cost.

Here are a few of the reasons for the outstanding performance of this NEW attachment:

- eight spindle speeds from 80 to 2720 RPM are provided
- spindle drive unit is back geared and designed to utilize full horsepower at all speeds without belt slippage.
- quill travel: 5".
- three steps of power feed to quill: .0015—.003—.006 inch per spindle revolution.
- positive 2 way power feed stop tripping mechanism.
- convenient changing of tools provided by spindle brake and lock.
- collet capacity up to $\frac{3}{4}$ " diameter.

Further and complete details available promptly on request.

**EQUIPMENT AVAILABLE
FOR THIS NEW UNIT**

Holders for shell mills
Fly cutting heads
No. 2 "Bridgeport" Boring Head

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines



**SEE FOR
YOURSELF**

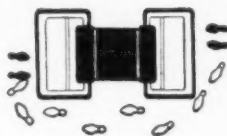


**FROM
TO
ROUGH
FINISH
GRIND
IN ONE STEP!**

**HEAVY DUTY
WET OR DRY
10" - 14" WHEELS**

**Type
10 TD
Tool
Grinder**

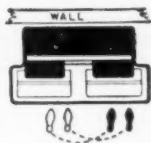
**PROMPT
DELIVERY**



OLD WAY

Lost time between
rough and finish grind.

Floor space wasted —
Grinder must be away
from wall.



NEW WAY

One step from rough to
finish grind.

Conserve floor space —
place Grinder against the
wall.

BULLETIN 18 IS JUST OFF THE PRESS! WRITE TODAY!

THE STANDARD ELECTRICAL TOOL CO.
2486 RIVER ROAD **CINCINNATI 4, OHIO**

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

ARMSTRONG



Quality
TOOLS



*Not a cost, but an investment
that pays year after year*

Buy ARMSTRONG TOOL HOLDERS and TOOLS for today's job and they will bring you added profits thru the years. With ARMSTRONG TOOL HOLDERS you will be permanently tooled up for whatever comes, for each is a multi-purpose tool that takes cutter-bits ground to many shapes. Each is an efficient tool, refined thru a half century of world wide use. Each has strength beyond any need, extra strength resulting from endless research and the most modern closely controlled manufacturing methods.

ARMSTRONG TOOL HOLDERS are inexpensive too, for they are produced in great numbers. They are instantly available because they are carried in stock by all leading supply houses in sizes and types for every operation on lathes, planers, slotters and shapers; for standard operations on turret lathes and screw machines. They are profitable in use because they permit the highest speeds and heaviest feeds, and "Save: All Forging, 70% Grinding and 90% High Speed Steel".

ARMSTRONG Lathe and Milling Machine Dogs are permanent tools too. They are drop-forged from special open hearth steel, are heat treated to extreme stiffness and toughness. They have alloy steel screws hardened at the tip to prevent up-setting and have double life, for hubs are made oversize to permit re-tapping.

ARMSTRONG Quality pays over and over again. Write for new S-48 catalog. It offers many opportunities to conserve profits.



ARMSTRONG BROS. TOOL CO.

"The Tool Holder People"

5208 W. ARMSTRONG AVENUE • CHICAGO 30, ILL.

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Published Monthly

Vol. 46 No. 1

JANUARY 1950

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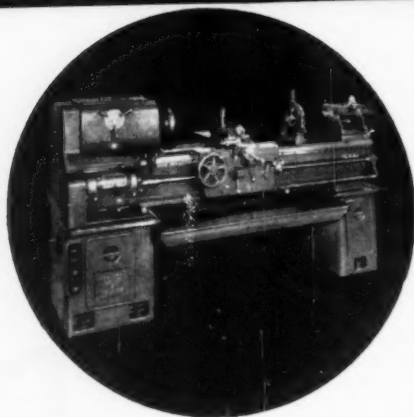
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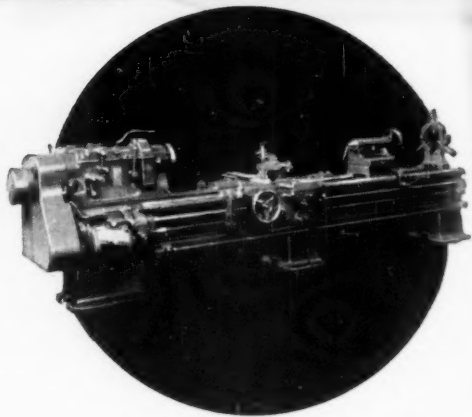


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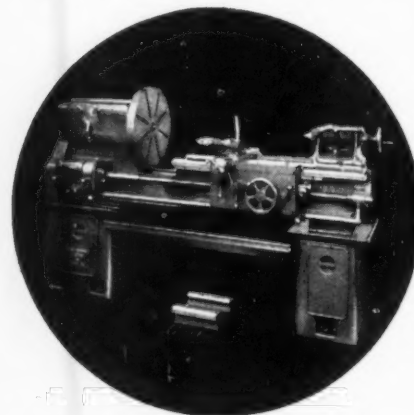
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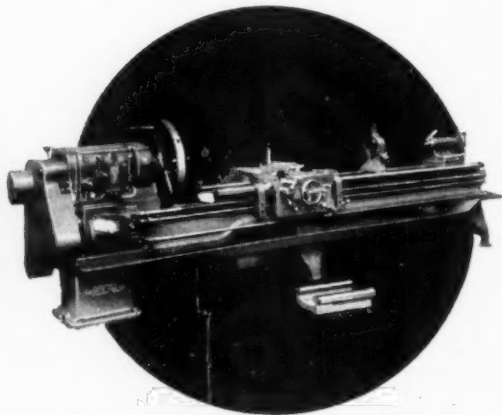
Tray-top Engine & Toolroom Lathes—10,
12 1/2, 15 & 18 swing sizes. Bulletin T-100



Standard Engine Lathes—14, 16, 18,
20, 22 & 24 swing sizes. Bulletin S-100



Tray-top fixed gap bed Engine Lathes
—15 & 18 swing sizes. Bulletin T-100



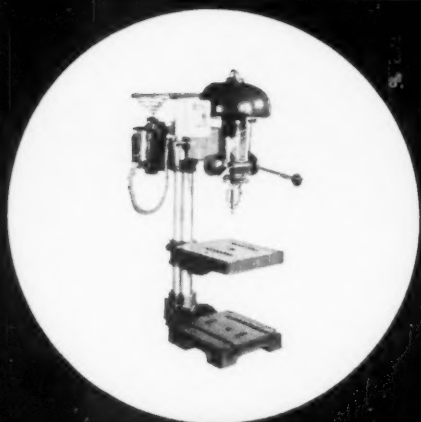
Standard fixed gap bed Engine Lathes—14,
16, 18, 20, 22 & 24 swing sizes. Bulletin S-100

+ **plus**
value

Cincinnati Lathe & Tool Co. announces with pride the acquisition of one of the largest, oldest, and most widely recognized lines of light, upright, sensitive, and radial drilling machines—formerly produced by The Canedy-Otto Manufacturing Company. So now, from one organization, you can obtain the best in economy priced drilling machines and accessories as well as medium (Standard) and light duty (Tray Top) lathes, backed by a leading name in lathe manufacture. Write today for new catalogs.

cincinnati LATHE & TOOL COMPANY
OAKLEY, CINCINNATI 9, OHIO

CANEDY
- OTTO



16" Royal sensitive bench and floor drill, single and multiple spindles. Bulletin 216.



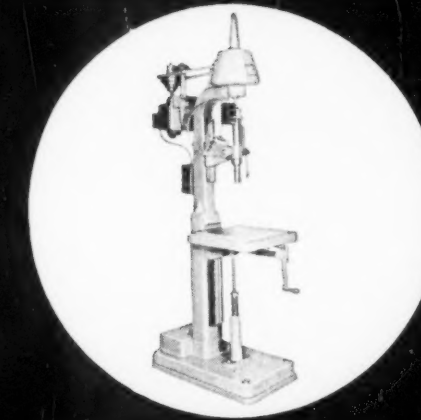
21" Box column sliding head floor drill, single spindle. Bulletin 100A.



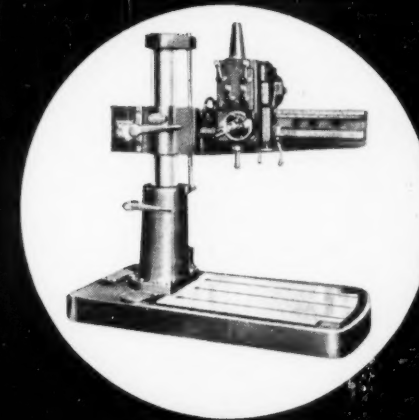
21" Box column sliding head floor drill, multiple spindle. Bulletin 100A.



18" Royal sensitive bench and floor drill, single and multiple spindle. Bulletin 218.



16" Box column sliding bench and floor drill, single spindle. Bulletin 155V, 119, 215.



Radial drills—3', 4', 5' arms; 7", 9" and 11" column. Bulletins 116 and CG-15.

2

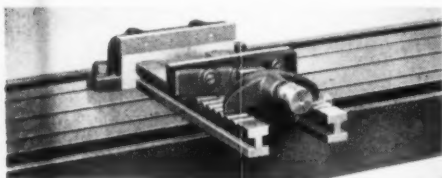
STANDARD CINCINNATI MILLING

Working Together

Close-up of milling operation performed with the aid of two Cincinnati Attachments—20" Circular Milling, and All-Steel Vise. A 10" diameter face milling cutter takes a $\frac{3}{16}$ " depth of cut, at a cutting speed of about 110 feet per minute.



Cincinnati Circular Milling Attachment. 16", 20" and 24" diameter tables. Power and hand feed. Catalog M-1660.



All-Steel Vise. Capacity 10" x 10". Extra long vises available with 24" or 40" openings. Catalog M-1665.

The setup shown here takes a short cut to machine the face and swivel diameter of universal slides. Both surfaces are milled in one rotation of the work. A Cincinnati 20" Circular Milling Attachment supplies the rotary motion, while a Cincinnati All-Steel Vise tightly grips the part. In addition to the short cut in machining, the All-Steel Vise eliminates the need for a special fixture.

¶ These two attachments are ruggedly constructed for heavy milling operations. The Circular Milling Attachment may be mounted on old and current design CINCINNATI Milling Machines, while the All-Steel Vise may be used with many machine tools—millers, shapers and drill presses. Chances are your shop needs these attachments. Our field engineers are at your service.

THE CINCINNATI MILLING MACHINE CO.

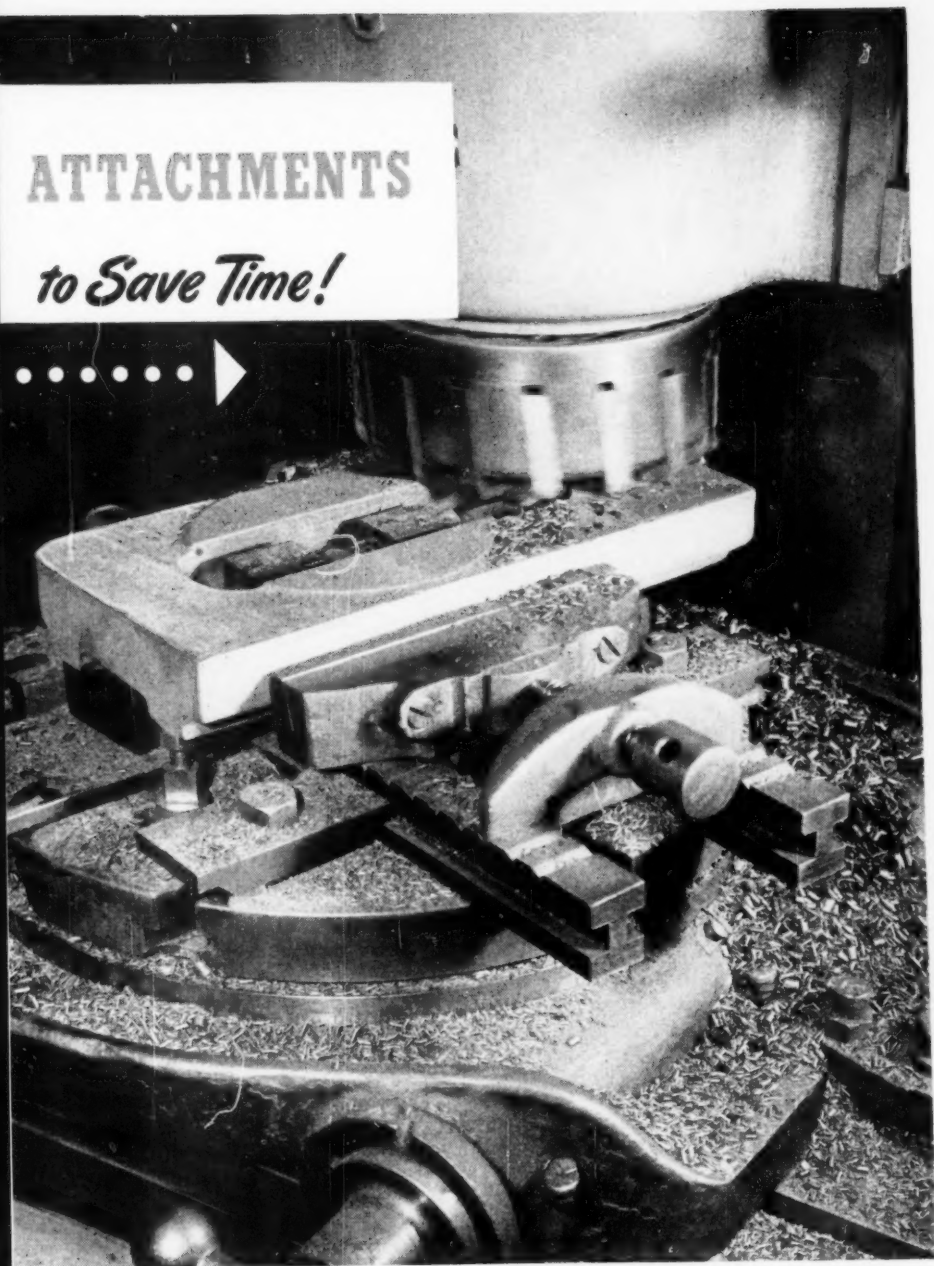
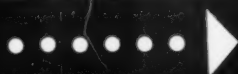


CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES • BROACHING MACHINES • CUTTER SHARPENING MACHINES
FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

ATTACHMENTS

to Save Time!



When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

Glenzer's

Utility Tools

33 YEARS IN THE SERVICE OF AMERICAN INDUSTRY

Glenzer has the all important know-how that can not be acquired overnight. That's why Glenzer tools are specified as *standard* by leaders in the automobile and dozens of other industries. *These users tested Glenzer products in laboratories and in production.* You, too, will be on the right track when you specify "Glenzer" as standard.

LIVE CENTERS

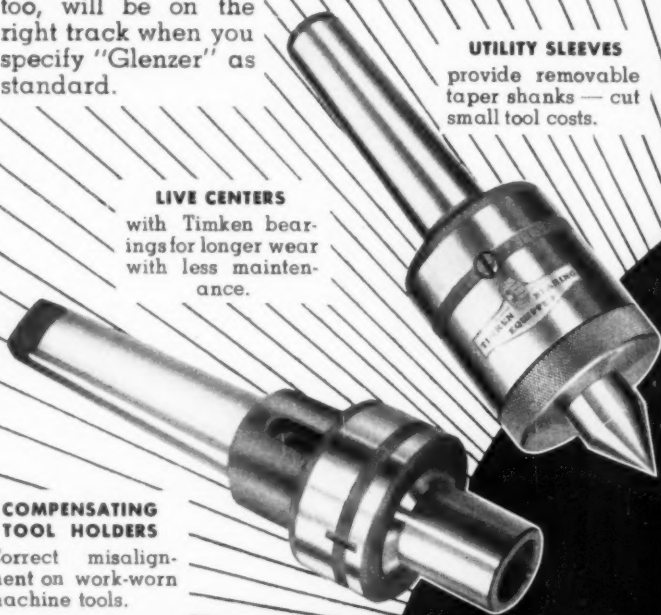
with Timken bearings for longer wear with less maintenance.

COMPENSATING TOOL HOLDERS

- Correct misalignment on work-worn machine tools.

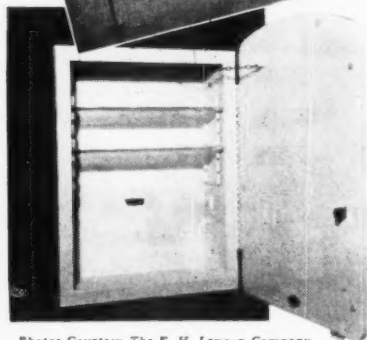
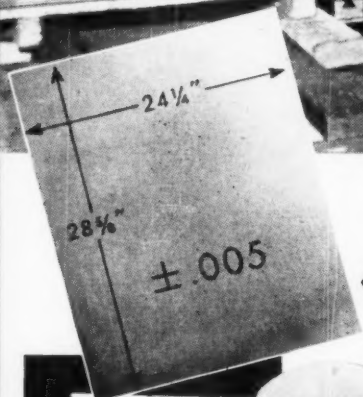
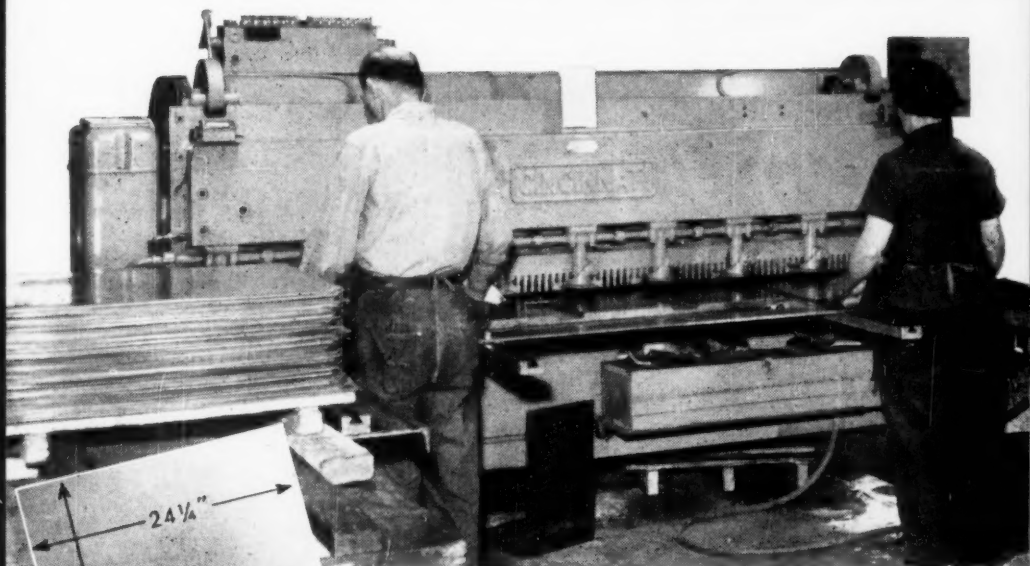
UTILITY SLEEVES

provide removable taper shanks — cut small tool costs.



THE J. C. **GLENZER** CO. Inc.

1546 E. NINE MILE ROAD, DETROIT 20, MICH.



Photos Courtesy: The F. H. Lawson Company

These accurate blanks are held to tolerances of $\pm .005$ on Cincinnati Shears in the shops of The F. H. Lawson Company, manufacturers of medicine cabinets, parts and all sorts of containers.



ALL ALONG THE LINE

←..... **this accurate blank**

SAVES MONEY!

At 400 an hour, accurate steel blanks, $24\frac{1}{4}'' \times 28\frac{5}{8}''$, are produced in lots of 10,000 from 26 gauge stock sheets.

Costs are low because of the accurate performance, rapid gauging, ease of control and safety features of Cincinnati All-Steel Shears. One and one-half to two million cuts are made before knives need regrinding—an important factor in the low cost.

The shear is so accurate that all along the production line rejects are very low. Gauging for forming and bending operations is simple and rapid, assembly is smooth, time and money are saved, and a high quality of product is maintained.

Write for your Shear Catalog S-5. Consult our Engineering Department on your shearing problems.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES

Another typical case where **MULTIPRESS**^{*} doubles production

* U. S. Pat. 2,811,111



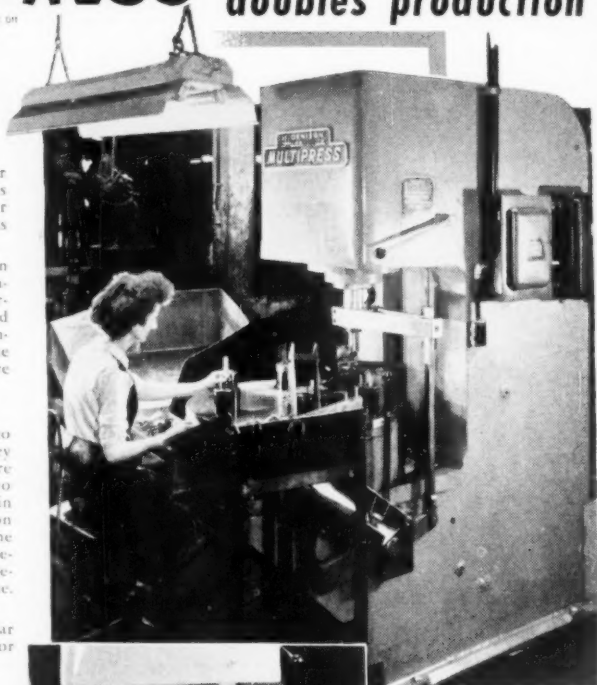
Up from 700 per hour to 1500 per hour! That's the gain made on this pressing and riveting job after switching to a 25-ton Multipress with Indexing Table.

The operation assembles a screw in the base of a wire-holder, or insulator. From dual hoppers, the operator picks a screw with one hand and a base with the other. She inserts the screws in the bases as she places one of the latter in each fixture on the six-station indexing table.

Multipress does the rest!

Parts are automatically indexed to the press ram, and riveted. As they move to the next station, they are loosened from the fixture by two steel pins operating on a cam within the table housing. At the ejection station, a device activated by the press ram strikes the units from below, and they are automatically deflected into an off-bearing chute. Ram pressure is preset at 20 tons.

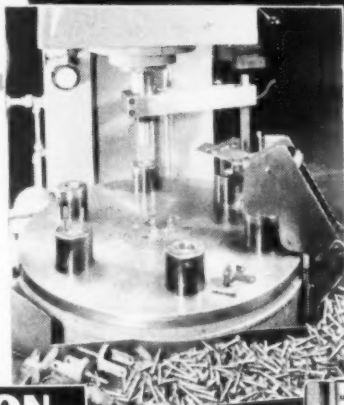
Take a tip from hundreds of similar case records; check Multipress for better, faster, lower-cost results!



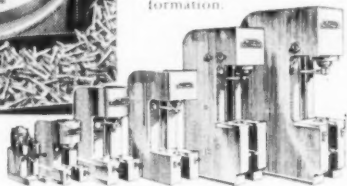
Model K Multipress delivers up to 25 tons of oil-smooth power under quick, accurate, "feather touch" control. Ram stroke is adjustable to 15 inches... maximum approach speeds to 540 ipm. Automatic controls keep the operator's hands safely away from the moving ram. Stroke length, approach speed, pressing speed and ram pressure are easily preset. Available with or without the Multipress Indexing Table.

The DENISON Engineering Co.

1184 Dublin Rd., Columbus 16, Ohio



MULTIPRESS offers a complete range of frame sizes, in capacities from 1 to 55 tons. Also available are Indexing Tables, accessories for foil marking, pelleting, coining and many other jobs, plus the new Harmonic Stock Feed for high-speed production from continuous metal strip. Write for information.





"SLASH" YOUR SET-UP TIME WITH THE TREE

TAPER BORING TOOL

Cut expensive set-up time from hours to a few minutes with the revolutionary TREE taper boring tool. You can use it on your present milling machine, jig borer or boring bar. Write today for complete information. In addition to boring taper holes this tool can be used for —



*Straight boring . . . as shown at left used as offset boring tool.



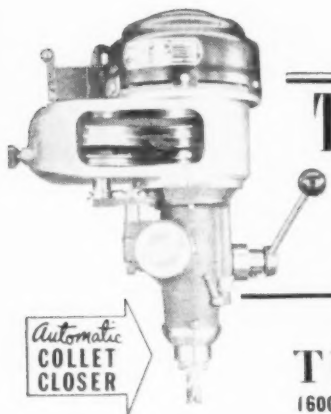
*Facing . . . up to 10" in diameter.



*Outside Turning . . . either straight or tapered up to 8" with extension bar.



Free Literature
On Request



Automatic
COLLET
CLOSER

TREE UNIVERSAL MILLING HEAD ATTACHMENT . . .

All Angle Milling, Drilling & Boring.
Compact Design. $\frac{3}{4}$ " Collet Capacity.
4" Quill Travel. Power Feed Eight
Speeds—
140-3500 RPM or 210-5200 RPM. Hardened
& Ground Spindle & Quill. Enclosed
Micrometer. Depth Stop.

For Full Information—Write Dept. B

TREE TOOL and DIE WORKS
1600 JUNCTION AVE. • RACINE, WISCONSIN



The **BUCKEYE**

**STREAM
POWER**



AIR WRENCH

• On the production line or on maintenance work, the Buckeye Air Wrench is always busy, cutting time and costs on nut-setting jobs. Its rotary vane-type motor provides fast, steady rotation that runs nuts down to exact torque without shock to nut, bolt or operator—and practically eliminates the problem of stripped threads.

Need extra torque for some nutsetting

jobs? . . . just run your Buckeye Air Wrench with the throttle open and use the tool as a ratchet wrench. Reversible? . . . you bet—and flexible, too . . . lightweight, easy to handle and compact enough to reach into those "hard-to-get-at" places.

For any nutsetting job up to 9/16" capacity, your best buy is Buckeye . . . a demonstration in your plant will show you why.

AIR TOOLS:

- HORIZONTAL GRINDERS and BUFFERS
- VERTICAL GRINDERS and SANDERS
- BELT SANDERS
- SHEARS
- NIBBLERS
- AIR WRENCHES
- DRILLS
- SCREWDRIVERS

**HIGH FREQUENCY
ELECTRIC
TOOLS:**

- GRINDERS
- BUFFERS
- SANDERS
- POLISHERS
- DRILLS
- SCREWDRIVERS
- NUTRUNNERS

**Have you seen the
BUCKEYE CATALOG?**

A copy of the fact-filled, helpful Air Tools Catalog is yours for the asking.

Buckeye Tools
CORPORATION

DIVISION 14 • DAYTON 1, OHIO

take a tip from **APEX**

To Cut Fastening Costs

USE **APEX** BITS ON



Phillips



Slotted



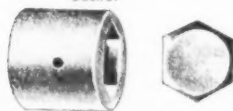
Clutch Head



Frearson



Socket



Hex Head*

*Double life on these! When one end wears, turn end for end to get a new socket.

• Driving Phillips, Slotted, Clutch Head, Frearson, Socket and Hex Head screws—using almost any make of air, electric or spiral driver—with Apex Bit Holders and Insert Type Bits, helps cut fastening costs.

Bit inventory is simplified—you just select the bit holders to fit your drivers, then order new bits as needed. Apex bit holders last indefinitely, and the cost of an Apex insert bit is about the same as the charge for reconditioning a one-piece solid bit.

You'll find Apex insert type bits last longer, too, because they "float" slightly in the holders, providing easier alignment in the screw recess and reducing wear.

SEND FOR CATALOG

Complete information available in Catalog No. 20—write, on your company letterhead, for your copy.

APEX

insert bits

THE APEX MACHINE & TOOL COMPANY

1028 S. Patterson Blvd. • Dayton 2, Ohio

Safety Friction Tapping Chucks • Vertical Float Tapping Chucks • Self-Releasing and Adjustable Stud Setters • Power Bits for Phillips, Frearson, Slotted Head, Clutch Head, Hex Head and Socket Screws • Hand Drivers for Phillips, Frearson and Clutch Head Screws • Aircraft and Industrial Universal Joints • Sockets and Universal Joint Socket Wrenches.

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15

TAPPING TECHNIQUES No. 4



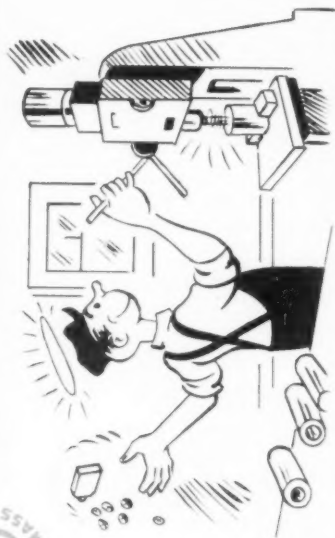
Here's the "tap" of the cobbler . . . who toils to repair,
And works on our soles . . . the kind that we wear.



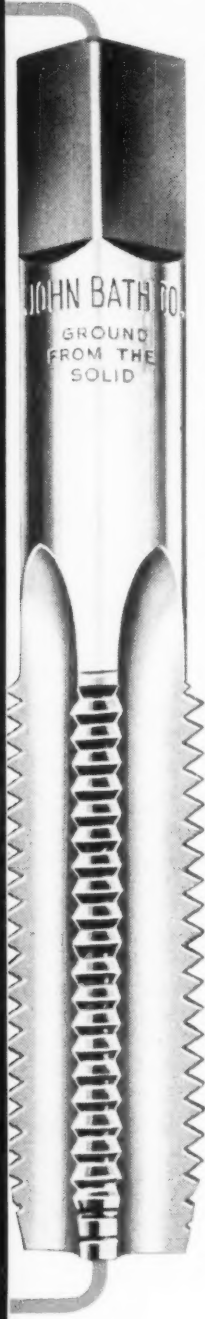
He chooses his leather with the greatest of care,
For the wrong kind of tap soon leaves our toes bare!



If, in using a tap, you select the wrong style,
Your threads will be ranned "no no" by a mile!



Insist on Bath taps . . . and select the right one.



INSIST ON BATH TAPS... PROFIT BY THEIR PLUS-PERFORMANCE

Bath taps are not just made... they have been especially designed to answer various requirements of threading different kinds of metals... are adapted to work under many different conditions of machine

equipment. Available for ordinary work in stock sizes and styles... or, custom designed for jobs that present an unusual problem. Let experienced Bath engineers help you with your tapping troubles!

PLUG AND RING THREAD GAGES • GROUND THREAD TAPS • INTERNAL MICROMETERS

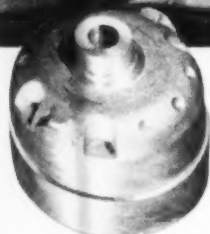
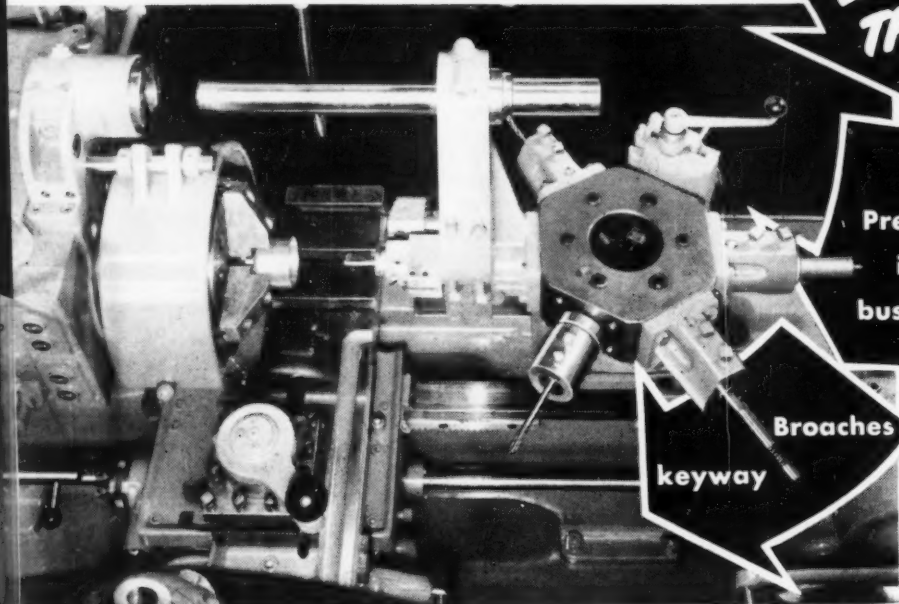
JOHN BATH CO. INCORPORATED
14 Grafton St., Worcester, Mass.

Turret Lathe Ideas -

**LIKE
THIS**

**Presses
in
bushing**

**Broaches
keyway**



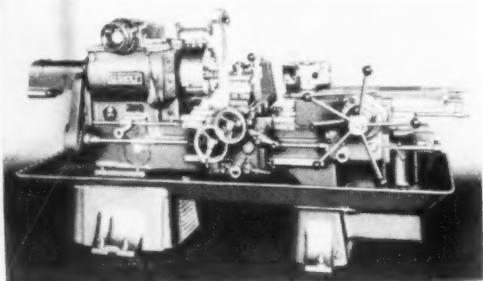
*Gisholt No. 3 Universal Ram
Type Turret Lathe*

Save you time and money... INCREASE PRODUCTION!

Darned clever, these production men!

Note the use of this Gisholt No. 3 Ram Type Turret Lathe. In addition to handling all the typical drilling, boring, facing and reaming operations on the inside of a small motor housing, this turret lathe is used to:

**Broach the keyway
Press in a bushing
Finish machine in place**



The entire operation on these parts takes only 1.37 minutes. Figure the time and cost saved in not having to transfer parts to other machines—or other departments—for these operations.

Don't overlook the many ways you can get greater production from your turret lathes. Gisholt engineers have all kinds of money-saving ideas to help you with your problems. Ask one to call. Or write us.



THE GISHOLT ROUND TABLE
represents the collective
experience of specialists in
the machining, surface-
finishing and balancing
of round and partly round
parts. Your problems are
welcomed here.

GISHOLT MACHINE COMPANY
Madison 10, Wis.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

15 NEW COST-CUTTERS

THE 15-IN-5 ROTOR CHIPPERS



5 "REGULARS"... 5 "SUPER-SPEEDS"... 5 "SUPER-SOCKS"
—ALL FROM 5 BASIC MODELS



Rotor Tool brings you the biggest step forward in chipping hammers in the past 15 years!

You can give Old Man Cost a blow he'll never forget with the sensational new ROTOR Chipping Hammers!

MORE VERSATILE. You can easily adapt each basic model to serve as 3 hammers to match your job: (1) A "regular" model, (2) A "super-speed" model, (3) A "super-sock" model—because you can switch from one to another by a simple change of parts.

SHORTER . . . easier to get into crowded quarters because of new exclusive "dough-nut" valve.

LIGHTER . . . easier to handle.

FASTER CUTTING because of new exclusive design.

Write for all the facts today!

AIR O'TOOL



THE **ROTOR TOOL** CO.
CLEVELAND OHIO

UNBIASED ANALYSIS OF PORTABLE TOOL PROBLEMS



2 ADVANCE-DESIGN

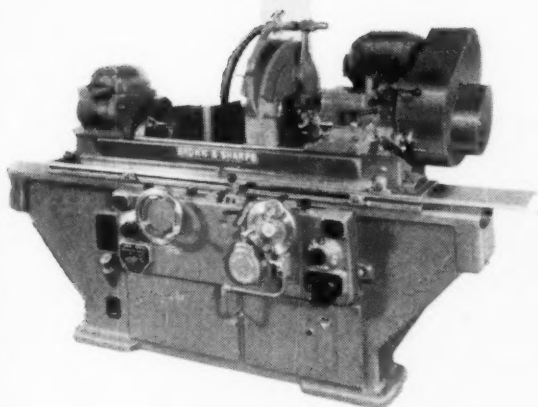
AUTOMATIC CYCLE ARRANGEMENTS

that increase percentage of grinding time

THE NEW Automatic Cycle and Spark-Timing Arrangement and the new Automatic Cycle and Sizing Arrangement make Brown & Sharpe Plain Grinding Machines even more productive and versatile. They assure extremely-rapid uniformity of sizing and finish, practically full-time grinding, a minimum of rejects . . . with less effort and attention from the operator.

A UNIQUE FEATURE common to both Arrangements is the *direct-contact wheel-to-work manual infeed* at the start of the cycle. This feature permits larger work tolerances in preceding operations. It eliminates the need of set-ups that favor the high limit of previous turning tolerances. Non-productive time is out . . . no "air-cutting"—net result, appreciably lower overall machining cost. Ease of disengagement permits the machines to be instantly available as standard plain grinding machines. Write for complete details of the new Arrangements now available on all Brown & Sharpe Plain Grinding Machines. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

BROWN &



No. 22 Plain Grinding Machine with Automatic Cycle and Spark-Timing Arrangement

AUTOMATIC CYCLE AND SPARK-TIMING ARRANGEMENT

On plunge-cut or transverse grinding where uniformity of sizing and finish is essential, this arrangement automatically controls spark time and operation at a predetermined rate (spark time adjustable from 2 to 180 seconds). Handwheel operation provides positive protection against automatic cycle starting accidentally.



No. 10 Plain Grinding Machine with Automatic Cycle and Sizing Arrangement

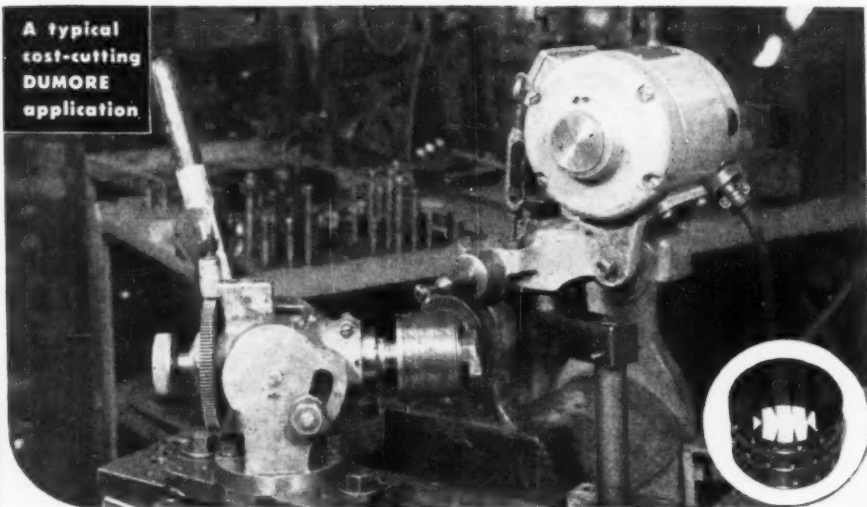
AUTOMATIC CYCLE AND SIZING ARRANGEMENT

For longer production runs on plunge-cut grinding where uniform sizing and finish to .0001" are desired, this arrangement offers maximum output at minimum cost and effort. It automatically sizes from work—eliminates compensating for wheel wear and effects of wheel truing.

SHARPE



**A typical
cost-cutting
DUMORE
application**



Low-cost Dumore milling set-up solves tough slotting problem

**\$150 Fixture on \$50 Handmill,
plus Dumore Series 44, Delivers
45 Slots per piece for 2.3¢**

Capitol Machine Company, Danbury, Connecticut, found Dumore Grinders the low-cost answer to a tough slotting job on brass stoker nozzles. Slots were only .022" wide in .080" material, causing slotting cutters to collapse and running tool costs out of sight. Mounting a Series 44 Dumore on a handmill, and using a \$150 fixture, Capitol found that a commutator milling cutter run at 5000 RPM, with the work revolving at 100 RPM, was good for 150 pieces, average. Each piece required 45 slots and cost per piece was only 2.3¢. Including labor, cost per piece ran only 17.7¢.

**Own 100 Dumores—sold on
speed, accuracy and economy**

Howard Taylor, founder of Capitol says: "We turn first to our DUMORE equipment when we strike special problems . . . every DUMORE application proves out from the cost angle. DUMORE balance and accuracy makes for high-speed production."

Here's a production milling tip

"We use a DUMORE Precision Lathe Grinder, with internal quill and end mill, mounted on head stock of lathe. We run the Dumore at high speed and revolve the work very slowly. We use a quick closing collet and install and remove parts quickly. Fast removal of metal and ease of work change make this operation fast and satisfactory."

Try it in your shop

Ask your DUMORE Distributor to demonstrate the low-cost DUMORE Tool-Post Grinder in your shop. Call him today or write to The DUMORE COMPANY, Dept. A-27, Racine, Wisconsin.

DUMORE

Export address:
The DUMORE COMPANY
13 East 40th St., New York 16, N.Y., U.S.A.



**Tool-post
Grinders**



Handgrinders



**Drill
Sander**



**High-Speed
Drill Press**



Quills



**Flexible
Shaft
Tools**

DANLY DIE SETS

LESS TIME IN THE DIE SHOP

Die assembly work is easier and more accurate when it's based on reliable Danly precision.

LONGER LIFE ON THE PRODUCTION LINE

Hardened, ground and lapped leader pins and precise bushing fits assure accurate die relationship and more parts per grind.

Danly Die Sets will assure the performance of your dies...and they mean greater convenience too! Large or small, standard or special, there's a Danly Die Set quickly available to meet your specific tooling requirements.

All standard Danly Die Sets are "on hand" in a nationwide system of assembly branches for prompt delivery from stock!

WRITE FOR THIS FREE BULLETIN

...and see how Danly's special die set machining service will mean important savings in your tool shop.

Which DANLY branch is closest to you?

- *Chicago 50, 2100 South 52nd Avenue
- *Cleveland 14, 1550 East 33rd Street
- *Dayton 2, 990 East Monument Avenue
- *Detroit 16, 1549 Temple Avenue
- *Grand Rapids, 113 Michigan Street, N.W.
- *Long Island City 1, 47-28 37th Street
- *Los Angeles 54, Ducommun Metals & Supply Co., 4890 South Alameda
- *Milwaukee 2, 111 East Wisconsin Avenue
- *Philadelphia 44, 18 West Chelton Avenue
- *Rochester 4, 16 Commercial Street

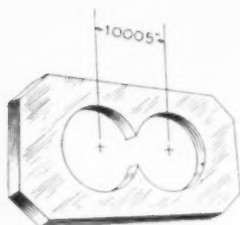
*Indicates complete stock

DANLY

DANLY MACHINE SPECIALTIES, Inc., 2100 South 52nd Avenue, Chicago 50, Illinois

OVER 25 YEARS OF DEPENDABLE SERVICE TO THE STAMPING INDUSTRY

Put jobs like this...



Two intersecting punched holes are reamed to size and location within .0005". The stainless steel work piece is held in a table fixture and fed into the cutter by transverse lever feed. $\frac{1}{8}$ " of stock is removed on the diameters. Production is 700 pieces per nine-hour shift on a Nichols Production Model Miller.

on "the miller that uses its head"

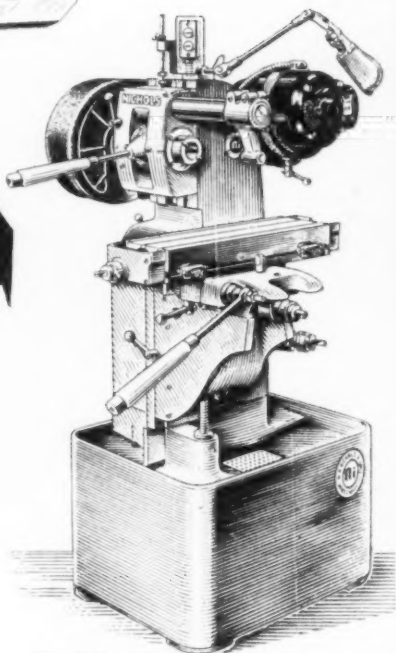
Because the Nichols Miller is endowed with an unusual versatility, by virtue of its unique rise-and-fall spindle, it is often a "jack of all trades" in a shop. In addition to conventional milling, it is used for such varied jobs as profiling, drilling, reaming, turning, boring, facing, key seating, broaching and vertical milling. Yet this same machine is designed so functionally and built so accurately that it is used for high production of precision parts with tolerances to "tenths."

Nichols Millers are made in the following models, all having the same basic features but modified especially for particular requirements: The Standard Model for general shop use; the Tool Room Model with special table and extra large micrometer dials for finer measuring control; the Semi-Automatic Model equipped with automatic pneumatic table feed; the Production Model with lever longitudinal and transverse feeds; and three Double Spindle Models for use where the simultaneous action of two cutters is practical.

MANUFACTURED BY W. H. NICHOLS COMPANY
WALTHAM, MASSACHUSETTS

CONDENSED SPECIFICATIONS

Table Working Surface	6 $\frac{3}{4}$ " x 21" or 30"
Longitudinal Travel (screw or lever)	10" or 19"
Transverse Travel (screw or lever)	7"
Vertical Travel — Knee	13 $\frac{1}{2}$ "
Rise and Fall of Spindle	4 $\frac{1}{2}$ "
Selective Speed Ranges up to 5000 R.P.M.	
Weight	1250 lbs.

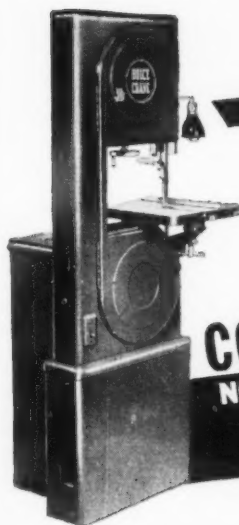


THE *Nichols* MILLER



See this machine, plus the full line of NICHOLS MILLERS at the A.S.T.E. SHOW, April 10-14, 1930, in Philadelphia.

Write today for new Nichols Miller Catalog which describes in detail all five models of "The Miller that uses its Head."



Announcing
THE SENSATIONAL, NEW
BOICE-CRANE
ALL-PURPOSE, COMBINATION
CONTOUR SAW-BAND FILER
NOW EVERY SHOP CAN AFFORD EQUIPMENT
FOR MODERN SHORT CUT CONTOUR
MACHINING BY BAND SAW!

Permits amazing savings in time and money. Ups production as much as 1000%.

Maintenance and short run production parts: tools; metal templates; special wrenches and wrench templates; cams; spiral parts; irregular shape stacked parts; stamping, forming and trimming dies all produced in minutes instead of the hours required by old methods involving milling, shaping and hand filing.

Precision filing and file broaching to a layout finish line and flash removal in ONE-NINTH the time required by hand and ONE-FOURTH the time required by reciprocating filing machine. Eliminates guesswork in angle filing.

The only combination Contour Saw and Band Filer with any one of 8 speeds instantly available up to 4100 blade f.p.m. for efficiently cutting wood, sponge rubber, masonite, etc.—and ranging down from there to a slow 92 blade f.p.m. A speed for cutting every metal and material like bar and sheet steel; steel, brass and aluminum tubing; hard rubber, transite, cast iron, plastics, bronze, synthetic glass; sheet asbestos; bakelite, and tool steel

up to 1" thick, and for filing a variety of metals and other industrial materials. Wheel speed chart, for cutting all these and more, mounted right on machine.

Permits all the modern, high speed production techniques of inside, as well as outside, contour sawing.

Heavy, rigid, 10-gauge solid welded steel frame.

Specially designed guides sharply reduce blade costs. Handle blades 3.16" to 3.4" wide.

15" x 15" heavy ribbed cast work table, ground to close machine tool limits and mounted on two heavy cast trunnions.

Enclosed Textolite disc wheels balanced for speeds in excess of 4100 blade f.p.m.

File bands are available for all purposes, in two widths, two shapes and six cuts. The file segments have exclusive, patented self-aligning ends which automatically lock to produce a continuous, rigid, flat surface.

Band Files in 1/4", 3/8", 1/2" widths. Flat and Oval, in a total of ten tooth styles to fit other make machines.

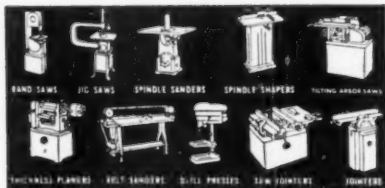
COMPACT - PORTABLE - ACCURATE - RUGGED - LOW COST

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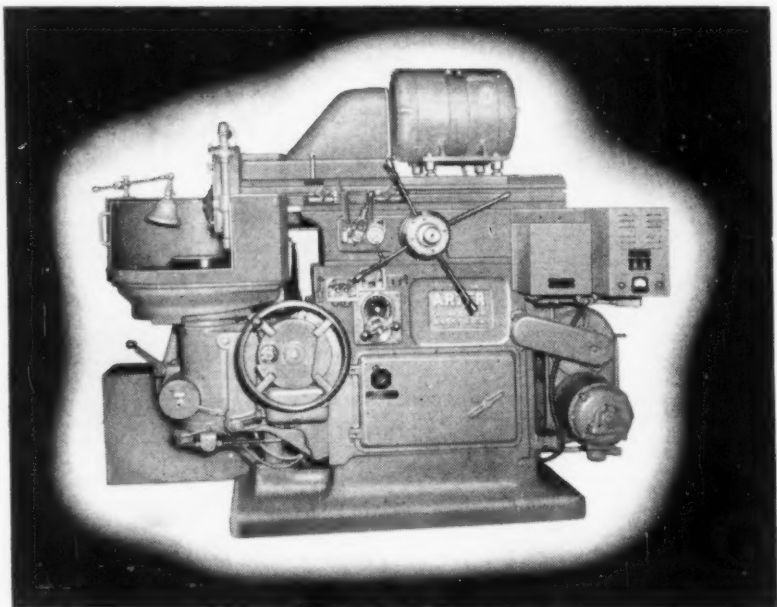


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Please send free literature on the new Boice-Crane
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ARTER MODEL D ROTARY SURFACE GRINDER



Production • Precision • Parallelism •

These machines, with years of know-how behind them, are cost-saving tools. Manufacturers are finding their investment is actually a money-saver because of the high production with precision rate.

It will pay you to look into the qualifications of these machines now.

- Wheel slide hydraulically operated, with piston rod and wheel spindle axis level with the longer, front extended, widened ways, gives smoothness to the traverse and stability to the spindle.
- Chuck spindle mounted top and bottom in double-row precision, preloaded ball bearings, driven by V belts from electric motor vari-speed drive unit.
- Balanced motor mounted directly on the slide delivers full power to wheel spindle.
- Chuck spindle speed 60 to 250 r.p.m.

ARTER
GRINDING MACHINE CO.
WORCESTER, MASSACHUSETTS • U. S. A.

LOCALITE

THE VITAL SEEING ZONE

**CUT COSTS
CUT COSTS
HELP YOUR WORKERS
SEE FASTER
EASILY
ACCURATELY**

Lighting each precision job with a Localite enables the worker to control the quantity and direction of light *exactly* as he needs it. In no other way can lighting be tailored so efficiently and so economically for the varied seeing needs of each worker and each task. Thousands of plants are cutting costs—increasing profits—with Localites. Check your needs, now.

ADJUSTA-TENSION CLOSED JOINT MODELS

LISTED BY UNDERWRITERS' LABORATORIES, INC.

Finest localized lighting equipment. Outstanding in design, utility, quality. Check the features of Adjusta-tension Localites. See the difference.

ADJUSTA-TENSION JOINTS

Arms instantly adjustable to any position desired for directing light. Joint tension may be adjusted to suit the job and the worker.

WIRING FULLY ENCLOSED

Complete protection against wiring wear and insulation damage. This feature is especially desirable under conditions of oil, dust, and fumes.

UNIVERSAL BASE

Base mounts on 4" round or octagonal outlet box or on any flat surface. For clamp mounting, a specially designed separate clamp mounts on base.



MODEL 099-PX-412

Reflector orifice 6 1/4" dia. Takes 100 watt A-21 medium screw base lamp. Double arm has 3 adjusta-tension joints. Overall length, 35 1/2". Vista green color mat finish baked enamel. Wired with oil resistant cord.

\$13.28 EACH in pkg. of 4
Single Units \$16.60 ea.

Open Joint Model 3470-P-172
\$6.52 EACH in pkg. of 6
Single Units \$8.15 ea.



MODEL 099-HX-412

Reflector orifice 5" x 3 3/8". Takes 100 watt A-21 medium screw base lamp. Double arm has 3 adjusta-tension joints. Overall length 33 3/8". Vista green color mat finish baked enamel. Wired with oil resistant cord.

\$12.80 EACH in pkg. of 4
Single Units \$16.60 ea.

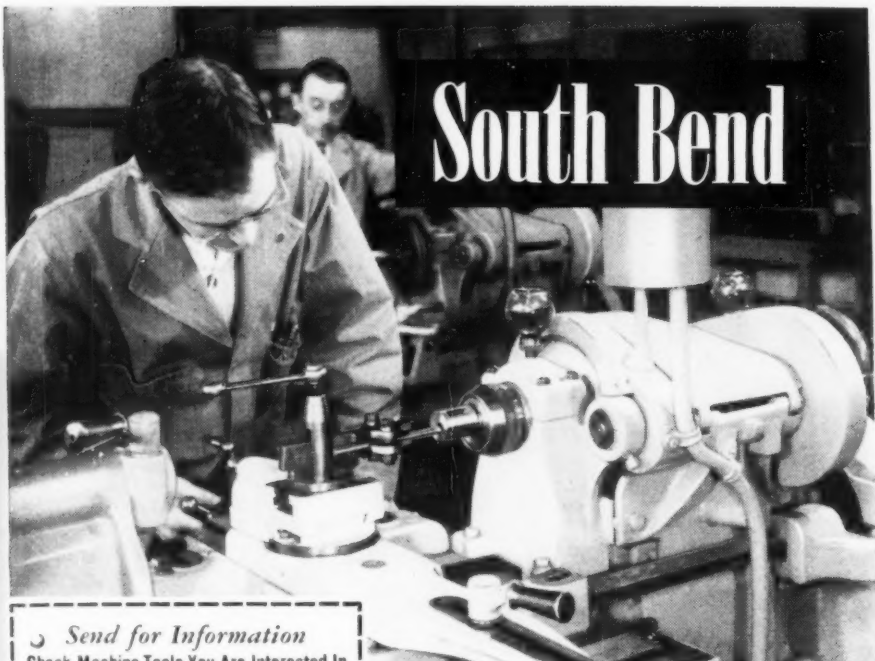
Open Joint Model 3267-H-174
\$5.56 EACH in pkg. of 6
Single Units \$6.95 ea.



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Write for free booklet on "Balanced Lighting" and our Complete catalog of Localite and Generalite models.

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FOSTORIA, OHIO, U. S. A.**



South Bend

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Check Machine Tools You Are Interested In

☐ 14-1/2" PRECISION LATHES



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9" and 10"



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1/2" and 1" collets



☐ 7" SHAPER

☐ 14" DRILL PRESS

☐ 10", 13", 16", 18/24" PRECISION LATHES

☐ LATHE TOOLS AND ATTACHMENTS

☐ TIME PAYMENT PLAN

Name

Street

City Zone

State

14-1/2" x 5', 1" collet, Toolroom Lathe with 1-1/2 h.p., 3 phase, 60 cycle, 220 volt motor and switch; \$1466²⁵
f.o.b. factory

Time Payments—\$367.25 down, \$97.07 for 12 months.

Precision Tolerances Easy

Because it is easy to machine work to the most exacting specifications with South Bend Lathes, they were selected by one of the largest steel manufacturers for use in their research laboratory shown in the illustration above. Here special tools, dies, fixtures and parts are machined to specified dimensions with ease and certainty.

Often the accuracy and quality of finish obtained with South Bend Lathes are such that subsequent grinding, honing, or lapping operations are unnecessary. Equally adaptable to toolroom, manufacturing, or maintenance operations, South Bend Lathes will give you years of satisfactory service for a minimum cost.

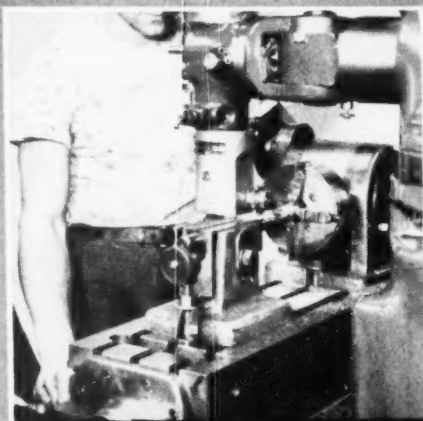
Building Better Tools Since 1906

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FOR VERTICAL AND
HORIZONTAL MILLING MACHINES

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Built by one of New England's oldest metal working specialists, the MILMASTER is a sturdy tool of proven value. Wherever it is used it has paid for itself in a matter of hours.

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140 Main Street, Springfield, Mass.

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Gain These Advantages Over Carburized Boring Bars:

1. Heavier Boring Without Permanent Set.
2. Heat Treated Alloy Steels with Higher Tensile Strength.
3. Deeper Case and Uniform Hardness.

We engineer and build all sizes and types of boring tools from $\frac{3}{4}$ " diameter to 8" diameter by 20' long.



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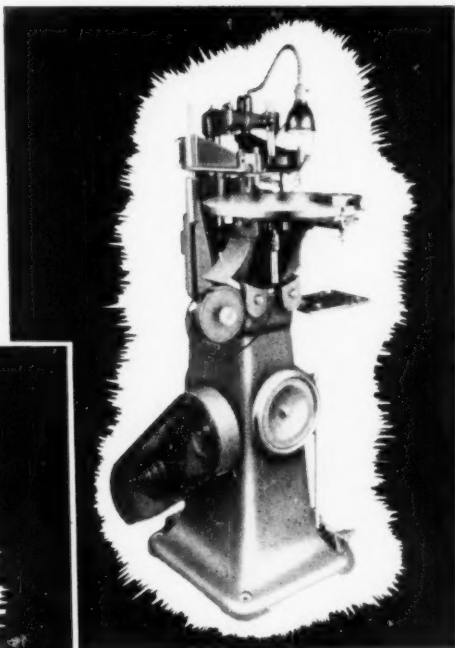
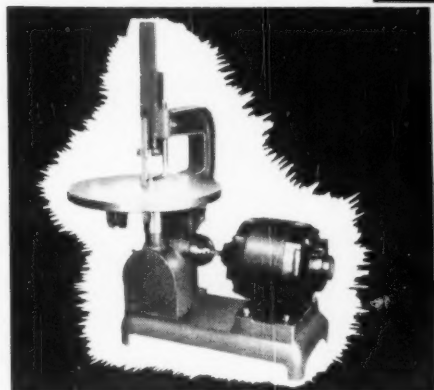


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of Giddings and Lewis Machine Tool Company
FOND DU LAC, WISCONSIN, U. S. A.

SAVE
DOLLARS

IN YOUR
TOOL ROOM



**OLIVER
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ADRIAN**

Save dollars in your tool room. OLIVER DIE MAKERS are saving as much as 60 PER CENT or more in tool rooms across America. The old obsolete hand method of Die Making is expensive, slow and laborious.

OLIVER OF ADRIAN

THE OLIVER DIE MAKER is *faster, more accurate, less operator's fatigue* and will modernize your tool making methods.

OLIVER DIE MAKERS come in five models. The Bench Model S-1, illustrated, is a single speed die maker for use on tool steel up to 1" thick. The Heavy Duty Model has 6 speeds, works in metal up to 3" thick, has variable strokes to 5" plus hydraulic feed.

WRITE today for complete technical data on Oliver Die Makers.

OLIVER INSTRUMENT CO.

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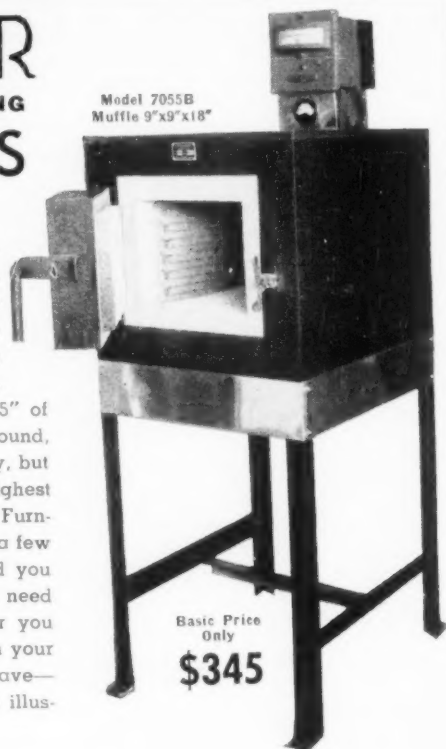
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AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL
POINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIE MAKING MACHINES

LUCIFER

ELECTRIC HEAT TREATING FURNACES

Lucifer introduces a completely new line of Electric Heat Treating Furnaces. The models No. 7055 are floor models — rigidly constructed of the finest materials obtainable and have a temperature range up to 2000°F. Look at the construction — at least 5" of insulating refractory all the way around, and not one or two types of refractory, but four different types are used for highest efficiency. That's why "LUCIFER" Furnaces are so cheap to operate — only a few cents an hour for most of them. And you only have to buy the equipment you need now — later you can add whatever you want without any premium or loss on your part. Think of the money you can save — and the convenience. Send for free illustrated literature.



MODEL	SIZE	BASIC PRICE	WITH ACCES. GROUP A	WITH ACCES. GROUP B	WITH ACCES. GROUP C	K.W.
7055A	6x6x12	\$195	add. \$39.60	add. \$98.60	add. \$172.50	4
7055B	9x9x18	\$345	" "	" "	" "	6.5
7055C	12x12x24	\$464	" "	" "	" "	13
7055D	18x18x36	\$945	" "	" "	" "	26
7051	6x6x6	\$155.25	Bench With Accessory (Group B)	FLOOR MODEL \$166.75	FLOOR MODEL \$339.25	2
7053	8x8x10	\$270.25	Bench With Accessory (Group B)	FLOOR MODEL \$281.75	FLOOR MODEL \$454.25	3.5
7052	12x12x12	\$385.25	Bench With Accessory (Group B)	FLOOR MODEL \$396.75	FLOOR MODEL \$570	6.5

ACCESSORY GROUP A—Pyrometer & Thermocouple
 ACCESSORY GROUP B—Pyrometer & Thermocouple and "Lutronic" automatic temperature control.
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SPECIAL SIZES AND TYPES MADE TO YOUR SPECIFICATIONS

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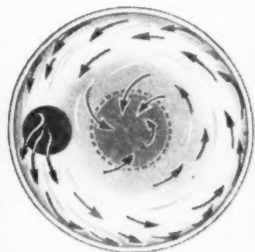
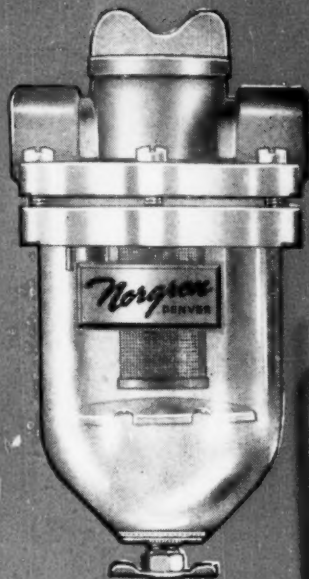
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Check Air Tool wear and corrosion

Norgren Transparent Bowl Filters keep air power CLEAN and DRY—for better equipment performance . . . less maintenance cost. New Norgren features prevent moisture, emulsions, rust, pipe scale and other dangerous impurities from entering tools and equipment—thus reducing corrosion and wear. Entirely automatic operation—No moving parts.

Write to C. A. NORGREN CO., 222 Santa Fe Drive, Denver 9, Colorado.

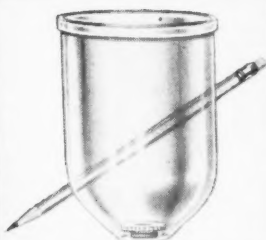
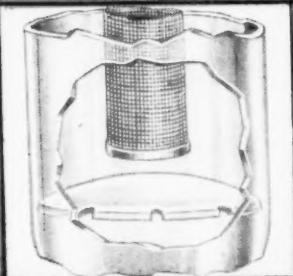
MTBB-150



▲ "Tornado Jet Action"

imparts swirling motion to air, separating and throwing moisture against outer wall.

"Baffle Plate"
divides bowl into two zones . . . "Active Zone" where separation takes place, "Quiet Zone" where moisture collects. Double Monel Wire Screen stops all solids.



▲ "Transparent Bowl"

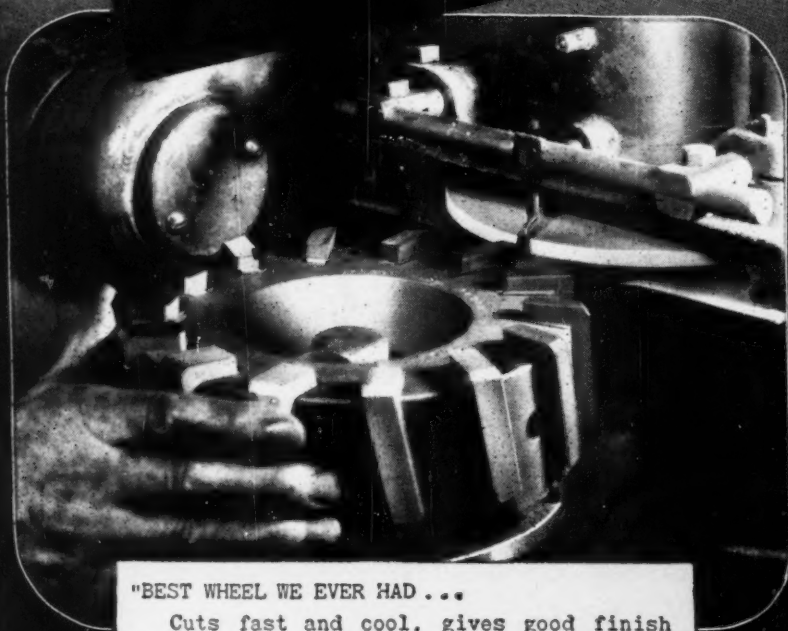
lets you see the filtering action—shows when the bowl needs draining.

See demonstrations of
NORGREN PRODUCTS
Booth No. 342
Plant Maintenance Show
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Norgren

Lubricators, Regulators, Filters, Valves,
Hose Assemblies, and other Air Controls.

It's no trick to
save money in your TOOL ROOM.



"BEST WHEEL WE EVER HAD ...

Cuts fast and cool, gives good finish and stays sharp", that is the recent report from a large Wisconsin manufacturer on the 32 ALUNDUM wheels which they use to sharpen high speed steel cutters on their Ingersoll cutter grinder. They've been enthusiastic ever since they first tried "32" on this job in 1946 using a 32A60-18VBE. They remove up to .050" of stock at .002" per pass, holding face runout to .0005" and periphery runout to .001" with no difficulty.

It's Really Easy with Cost Cutting 32 ALUNDUM Tool Grinding Wheels

4 to 6 Times Faster Cutting

In plant after plant they are finding that the extra sharpness of 32 ALUNDUM wheels enables them to remove stock from high speed steel and cast alloy tools at the rate of .002" to .003" per pass as compared to .0005" for ordinary tool wheels.

No Dressing on Multi-tooth Cutters

And "32" wheels stay sharp longer. You can go all the way around even a large multi-tooth cutter without having to stop and dress a 32 ALUNDUM wheel.

Less Tool Spoilage

32 ALUNDUM grinding wheels cut so cool that there's far less danger of spoiling heat-sensitive high speed steel tools—even with inexperienced operators.

Here's the Reason for "32's" Record

Breaking Performance—The grains of 32 ALUNDUM abrasive are produced by a special, patented electric furnace process which gives them many sharp points on all sides—no matter how they are bonded into a wheel each grain presents one or more cutting faces. And because the grains are over 99% pure fused alumina they have exceptional resistance to dulling.



W-1271

162 Pages of Practical Information—That's what you get in this Norton Handbook on Tool Room Grinding. It tells you when to use 32 ALUNDUM wheels and when to use the other Norton abrasives—such as 38 ALUNDUM, 57 ALUNDUM and regular ALUNDUM, to cut tool room costs. Send for your copy—just ask for Form 835-A.

LATHE TOOLS

PLANER TOOLS

MILLING CUTTERS

REAMERS

BROACHES

DRILLS

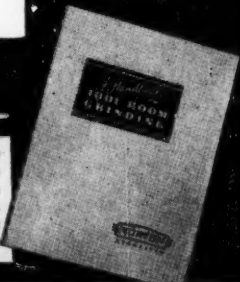
TAPS

CHASERS

HOBS

FORM TOOLS

SLITTING SAWS



NORTON COMPANY, WORCESTER 6, MASS. • Warehouses in Five Cities • Distributors in All Principal Cities



NEUTROL
Magnetic
Chuck
Controls

WHEREVER MAGNETIC CHUCKS ARE USED



THE ELECTRO-MATIC RECTIFIER AND NEUTROL MAGNETIC CHUCK
CONTROL ARE INDISPENSABLE FOR BETTER AND SAFER
GRINDER PERFORMANCE

NEUTROL Magnetic Chuck Controls speedily release and demagnetize workpieces. With NEUTROL, there's no need to hammer or pry to release the work. This saves time and tempers—saves marred, distorted workpieces and prevents damaging of chuck faces. NEUTROL also protects chucks against harmful voltage surges.

ELECTRO-MATIC Rectifiers are sturdy, heavy duty, direct current supply units, engineered to "stand up" day-after-day in the hardest service. They are available in any desired voltage combination in capacities ranging from 50 to 20,000 watts.

NEUTROL and ELECTRO-MATIC Rectifiers can be installed easily on equipment already in use—or built into new machines before delivery if you so specify.

Let us send bulletins giving full information—no obligation.

ELECTRO-MATIC PRODUCTS CO.
2235 North Knox Ave., Chicago 39, Illinois



ELECTRO-MATIC

**Industrial
Rectifiers**



STOP DUST MENACE

WITH *Hammond*
DUSKOLECTORS

DUST CONTROL A MUST!

Progressive manufacturers, Production Managers and State Health Inspectors all agree that dust laden air

- (1) Impairs employee health
- (2) Reduces employee efficiency
- (3) Ruins valuable machinery



CYCLONE TYPE

1/2 HP, 1 HP, and
1 1/2 HP.



MODEL 50 - 1 HP, 1000 CFM.

Hammond DUSKOLECTORS will solve your dust problem. Recommended for tool grinding, general grinding and for polishing operations, etc., etc.

CABINET TYPE—1/4 HP, 1/2 HP, and 1 HP.

Write for folder and complete information.

Hammond
OF KALAMAZOO
GOOD MACHINERY SINCE '82

Hammond Machinery Builders
INC.

1614 DOUGLAS AVENUE • KALAMAZOO, MICHIGAN

the button does it



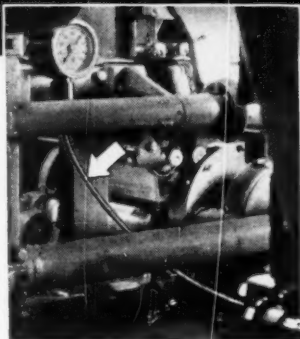
Merz New-Matic Measuring Machines—and only Merz—give you air gaging that coincides *exactly* with mechanical checking. THE EXCLUSIVE SAPPHIRE BUTTON DOES IT! In Merz New-Matic Measuring Machines air pressure is metered *only* by the *Sapphire* spindle button. Only the *Sapphire* button contacts the surface measured. Thus, only the *actual* dimension is measured—readings are totally unaffected by surface variations, perforations, key ways, etc. Now—for

the first time ever—you can have all the speed and ease of air gaging with precision accuracy that equals or excels mechanical checking. Now you can place air gages and mechanical gages side-by-side on your production lines—and get identical readings, every time! Let your Merz gaging specialist give you a demonstration—in *your own plant, on your own work*. Write today!

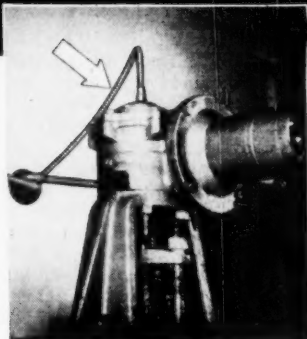
MERZ ENGINEERING COMPANY
Indianapolis 7, Indiana



Simplify and Save with **S.S.WHITE FLEXIBLE SHAFTS**



FOR POWER DRIVE



FOR REMOTE CONTROL

S.S.White flexible shafts provide the simplest way to drive or control parts from remote points. They function as single, self-contained mechanical elements and can be run along any desired path between a part and its drive or control.

This one-piece simplicity saves parts — eliminates expensive design and layout work — and it cuts assembly time and costs.

Recognition of the money-saving advantages of S.S.White flexible shafts has led to their use in a large number of applications. The tachometer drive on the newspaper press (left above) and the valve position indicator control (right above) are examples.

BULLETIN 4501 has details on how to select and apply flexible shafts. Write for a free copy today.



S.S.WHITE INDUSTRIAL

THE S. S. WHITE DENTAL MFG. CO. DIVISION
DEPT. H, 10 EAST 40th ST., NEW YORK 16, N. Y.



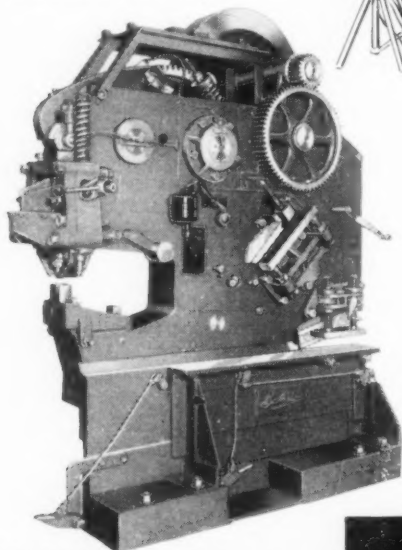
FLEXIBLE SHAFTS AND ACCESSORIES
MOLDED PLASTICS PRODUCTS—MOLDED RESISTORS

One of America's AAAA Industrial Enterprises

MORE OPERATIONS AT ONCE

YOUR KEY TO LOW-COST FABRICATION

"Buffalo" UNIVERSAL IRON WORKERS can do the work of five machines in your shop—as many as 3 operations at once—on your heavy maintenance or production fabrication! 3 men can cut, shear and punch at once on the Universal Iron Worker. Other models available with built-in notcher and copier. You save shop space. You save the cost of extra machines. And, most important, you save valuable man-hours. Put a "Buffalo" U.I.W. in your shop, and you'll agree, as thousands of users do, that it's the most profitable machine in the shop!



WRITE FOR BULLETIN

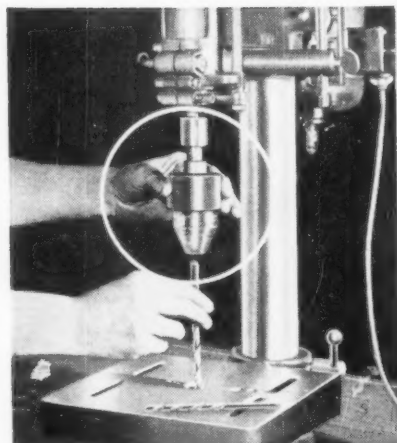
360-C for all details on all models available to suit your particular requirements in these rugged, fast, accurate multiple-operation machines.

BUFFALO FORGE COMPANY

161 MORTIMER ST., BUFFALO, N.Y.
Canadian Blower & Forge Co., Ltd.
Kitchener, Ont.

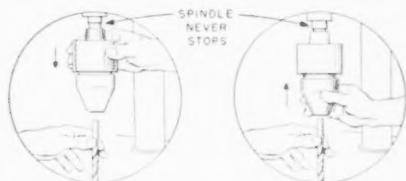
"Buffalo"
UNIVERSAL
IRON WORKERS

Change drills in a second, safely with this Automatic Chuck while spindle is running



AMF Wahlstrom Chucks are rugged tools, proven out in many years of heavy production work. Simple construction assures ease of operation.

HERE'S ALL THERE IS TO CHANGING DRILLS



1. Grip sleeve—pull down
—jaws open automatically
—drill is released.

2. Insert new drill—push
up tapered part—drill is
locked in place.

You don't stop the machine to change drills with the AMF WAHLSTROM CHUCK. No keys, collets or wrenches are needed.

That's why Wahlstrom Chucks cut costly minutes in changing tools for drill press work or for spotting, drilling and reaming in boring or milling machines. They'll also save money in lathe work for burring, turning, filing, etc. *One spindle does the work of several.*

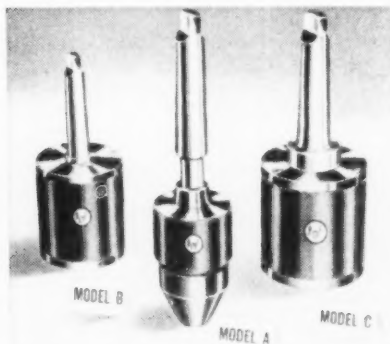
Tools last longer, too... smooth, hardened and ground jaws grip tight without chewing into tools. Grip increases with the load.

For fast, uninterrupted production, use the quick-change AMF WAHLSTROM CHUCK. It is the only fully automatic drill chuck which holds the widest range of straight shank tools...Model A— $1/32''$ to $1/2''$; Model AA— $1/64''$ to $3/8''$.

See your local distributor or write today
for Bulletin 56-4

WAHLSTROM TOOL DIVISION, AMERICAN MACHINE & FOUNDRY CO.
5502 SECOND AVENUE BROOKLYN 20, N. Y.

THESE WAHLSTROM TOOLS CUT COSTS, TOO



Wahlstrom Chucks are available in several size ranges:
Model A— $1/32''$ to $1/2''$; Model AA— $1/64''$ to $3/8''$
Model B— $15/64''$ to $1/2''$; $3/8''$ to $3/4''$; $17/32''$ to $1''$
Model C—Holds any size tool with No. 1, 2, or 3 M. T. Shank

WAHLSTROM
fully automatic
DRILL CHUCKS

NO KEYS, COLLETS OR WRENCHES



Are you still paying for equipment you bought 20 YEARS AGO?



YOU CERTAINLY ARE... if you are losing the production economies you can obtain with the modern WADE No. 8A Toolmaker's Precision Lathe. Obsolete equipment is expensive to own!

You can **CUT your COSTS**, and **INCREASE your PRODUCTION** with the "8A", a lathe that is smooth-running, quiet, easy to operate... with features you would never expect to find on a lathe of this size.

Variable Speed Drive, with stepless spindle speeds from 32 to 2000 R.P.M. (With back gears engaged, speeds are from 32 to 220 R.P.M.).

Electric Tachometer registers spindle speeds only when the motor is running.

Clutch permits you to start, stop, and brake the spindle with the motor running.

Ample Torque for low speeds, matched V-belts for high speeds.

Rear Station Tool Block previously found only on larger lathes.

Ample Front Guideway on the bed. You can take heavier cuts and obtain finer finishes, free of chatter!

Thread-lock Spindle Nose for accurate, positive clamping and safe cutting of face plates or jaw chucks.

Full-bearing Tailstock has a bearing the full length of the barrel in any position.

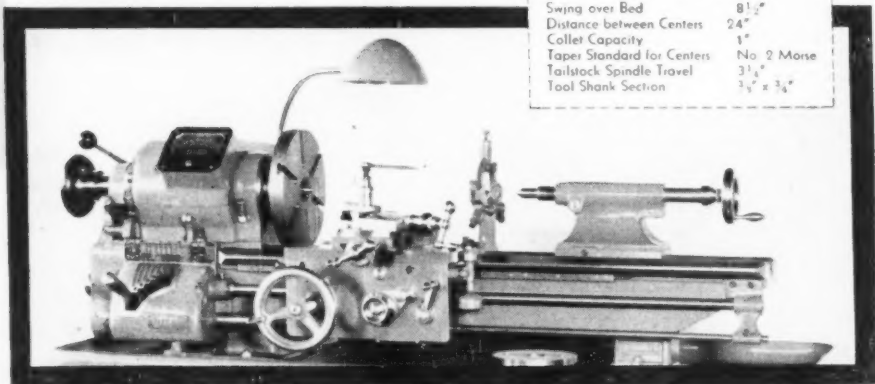
Complete Electrical System with reversible starter.

Send for the "8A Bulletin" for yourself how you can save by having this fine lathe in your plant. You will understand why—more and more—industry is turning the Wade way!

THE **Wade** TOOL CO., 51 River St., Waltham, Mass.

SPECIFICATIONS

Swing over Bed	8 1/2"
Distance between Centers	24"
Collet Capacity	1"
Taper Standard for Centers	No. 2 Morse
Tailstock Spindle Travel	3 1/4"
Tool Shank Section	3 1/4" x 3 1/4"



**CAM GRINDING
IMPROVES COLLETS
7 WAYS**

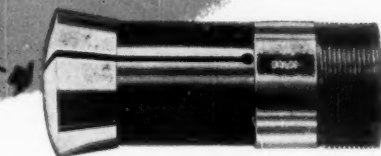
BALAS

CAM-GROUND

COLLETS

"Tough and True Running"

built by Specialists



● There are seven reasons why you can increase the performance of your machines and do better work with Balas Cam Ground Collets.

For example, the diagrams above show how Balas Cam Ground Collets always bear on the taper regardless of whether or not the stock runs true to size, while ordinary round ground collets bear on the edges of the collet segment and tend to stick and also allow the work to chatter.

Order Balas Cam Ground Collets to be sure of getting these seven definite advantages: 1. No sticking in the chuck head when operating with undersized stock. 2. Faster opening. 3. Tighter gripping. 4. Reduced chatter. 5. Less tendency to push stock back. 6. Chucking mechanism closes easier with lower strain. 7. Much smaller amount of breakage.

Why not get the full story on how Balas Collets can save you money? Send for latest price list and catalog now!



BALAS COLLET MANUFACTURING CO.
1561 EAST 27th STREET • CLEVELAND 14, OHIO
WORLD'S LARGEST MANUFACTURER OF COLLETS EXCLUSIVELY

BALAS COLLET MANUFACTURING CO. 1561 E 27th Street, Cleveland 14, Ohio
Please send copy of New Balas Catalog and Price List

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____



**COSTS COME
PRODUCTION GOES UP!
DOWN!**

WHEN H. S. S. TOOLS ARE HARDENED THE SENTRY WAY

Assure full hardness and extreme toughness in your High Speed Steel Tools and Cutters by hardening them in Sentry Electric Furnaces. Cutting edges stand up longer and tools last longer — more production between grinds and lower costs.

Sentry Furnaces, utilizing Sentry Diamond Blocks to obtain a neutral atmosphere, insure uniform hardness without burning. No decarburization — no scaling. Work is true to size with clean surfaces eliminating costly finishing operations.



Write for full information.
Ask for bulletin 1054-D16



SENTRY
MODEL Y

The Sentry Company

FOXBORO, MASS., U.S.A.



CHICAGO

Powerful

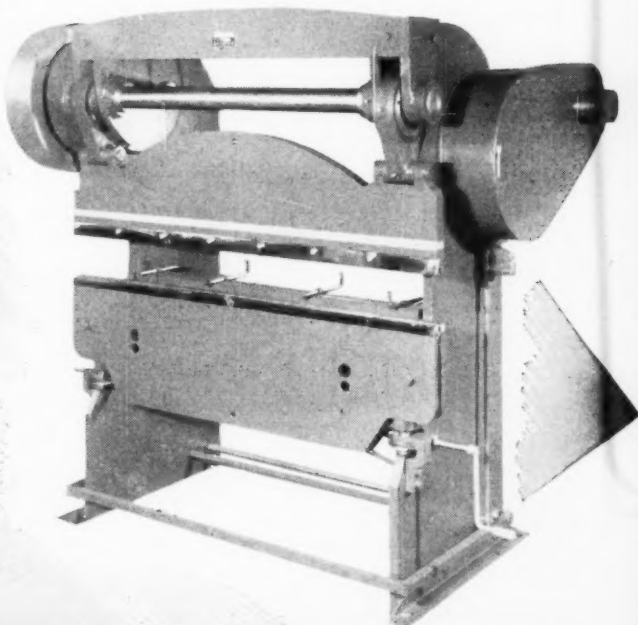
TYPE "300"

STEEL PRESS BRAKE

A Press Brake made to exacting standards and built to take hard and continuous use.

This press will do your work well and efficiently. Dependable service is guaranteed and proven by many years of operation. Variable speed drive for speed and safety.

This is only one of the many fine presses made under the banner CHICAGO. There is a CHICAGO steel press brake to meet your requirements. Your die problems are ours—let us help you.



DREIS & KRUMP MANUFACTURING CO.
7440 LOOMIS BLVD. . . CHICAGO 36, ILLINOIS

MOORE Creates

ANOTHER Great Jig Borer

You purchased 1,000 Moore Jig Borers during the last 15 years. So outstanding is their performance record that impartial judges call the Moore Jig Borer "the best machine tool for the money built in the United States."

In answer to popular demand, Moore now consolidates this extensive experience into a larger model and incorporates into it the ultimate in jig borer construction. The new No. 2 model extends the exclusive Moore principle of accurate lead screws, assuring precise, rapid table settings within .0001" by coordinate location, and adds numerous significant features, including:

1. **Increased capacity and size**—heavier cuts, larger holes—up to 5" in mild steel or cast-iron.
2. **Infinitely variable spindle speeds**, push-button controlled—range from 90 to 2400 RPM.
3. **Three power feed ratios**, .0015", .003", and .006", per revolution of spindle in either direction.
4. **Centralized control panel** (and tachometer) for spindle speeds and one-shot lubrication.
5. **Disconnect clutch** for easy indicating.
6. **Satin chrome finish** on all dials and handwheels eliminates glare and rust.
7. **Trip mechanism** prevents jamming of lead screw nuts through over-travel.
8. **Totally enclosed drive mechanism**—no open belts or sheaves.

Moore No. 2 Jig Borer Specifications

Table working surface	10" x 10"	Vertical adj. quill housing	10"
Table travel longitudinal	16½"	Spindle quill travel	5"
Table travel crosswise	10½"	Spindle center to column ways	10"
Table top to spindle end	min 3" max 18"	Spindle cen. to col. below ways	11½"

Send for descriptive literature.



HAVE YOU BOUGHT YOUR COPY OF "PRECISION HOLE LOCATION"?

Over 5,000 copies of this valuable book on toolmaking practices have been sold to date. Available at special price of \$3. 448 pages, over 400 illustrations, 184 pages of Woodworth Coordinate Location Tables from 1 to 100 holes. Send check or money order to Moore Special Tool Co., Inc., Bridgeport 7, Conn.



MOORE'S Famous No. 1 Model Remains in the Line



For its range—table working surface of 10" x 16" and cuts up to 3½"—this machine with 1,000 satisfied users is still an ideal buy and will be continued to be offered for the many situations where a small, accurate jig borer fills the required prescription.

MOORE SPECIAL TOOL CO., INC.
728 UNION AVE. BRIDGEPORT 7, CONN.

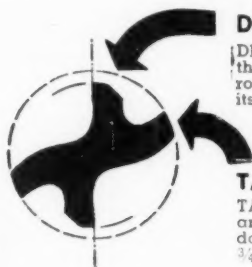
Add a MOORE to YOUR TOOLROOM

JIG BORERS • JIG GRINDERS • PANTO-CRUSH WHEEL DRESSERS
DIE FLIPPERS • COMPLETE LINE OF HOLE LOCATION ACCESSORIES

DRILL and TAP IN ONE OPERATION

SUBLAND DESIGN NOW MAKES IT POSSIBLE

*** At last it has been done—a tool that combines these two jobs. Mohawks refinement of the subland design means short cuts that have been mechanics' dreams and engineers' ambitions for years.



DRILL

DRILL — smaller than the tap yet larger than root dia. — circle ground its entire length.

TAP

TAP — Available in NC and NF threads in standard sizes from $\frac{1}{4}$ " to $\frac{3}{4}$ ".

Write for
design templates



DRILL
REAM



DRILL
COUNTER
BORE



CORE
REAM

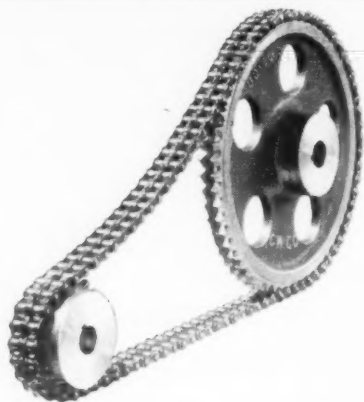


2 STEP
CORE
DRILL



DRILL
COUNTER
SINK

MOHAWK TOOL COMPANY • 21641 Dequindre • Hazel Park, Mich.

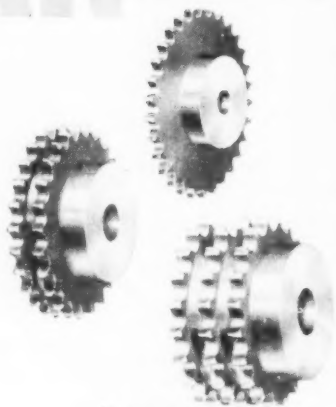


CULLMAN

SPROCKETS

**OVER 80,000 Sprockets and 80,000 Feet
of Chain Now in Stock**

There are important advantages in bringing your sprocket requirements to Cullman Wheel. Chief among these is the fact that in fifty-five years of specialization in the design and manufacture of sprockets and kindred power transmission parts, has built up the amazing total of over eighty thousand sprockets in stock. Invariably your requirements can be met quickly from this great sprocket and chain inventory. This always brings the cost down. Quick delivery is also available at Cullman on special made to order sprockets. Send your blue prints for recommendations and estimates.



Be sure to write for our Cullman Sprocket Catalog



TODAY

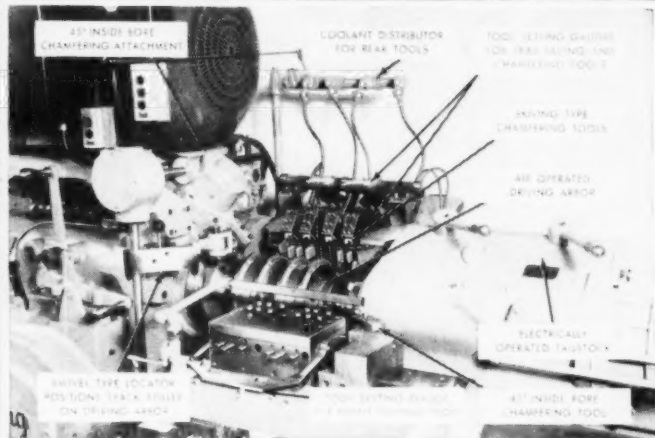
CULLMAN WHEEL COMPANY

109-S

1350 W. ALTGELD STREET • CHICAGO 14, ILLINOIS

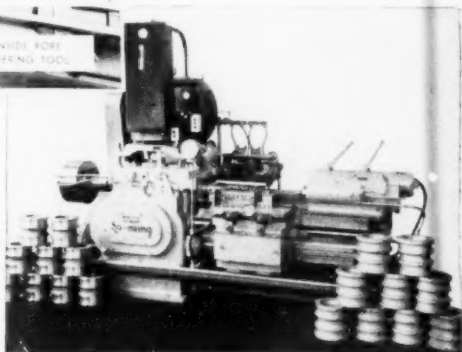
MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



Close-up view of tooling.

Overall view of machine showing rough and finished work.



MODEL R-14 Lo-swingy Lathe Cuts Machining Time on Track Rollers

Problem: To automatically turn, face and chamfer Track Rollers in one operation.

Solution: The Model R-14 Automatic Lo-swing Lathe was selected for this job due to its rigid construction and its demonstrated fine performance with cemented carbide tools. The Track Rollers, 9-3/4" in diameter and 9-3/8" long, are held and driven from the rough forged bore with a compensating type, six jaw air operated driver. The tailstock, shown in the withdrawn position in the lower illustration, is electrically operated and has a travel of 16" to facilitate loading and unloading of the rollers on the driver. The upper illustration

shows the tooling which consists of six front turning tools, eight heavy rear facing tools, eight small chamfering tools and two chamfering tools for the inside diameter. Note the special cam operated, 45° inside bore chamfering attachment mounted on the headstock of the lathe. Swivel type tool-setting gauges, mounted directly on the tool blocks, reduce tool-setting time. All tools are cemented tungsten carbide operating at cutting speed of 350 ft. per minute. Total floor to floor time for the job is 3.5 minutes each.

Engineered jobs are our specialty, and our staff is at your disposal to assist in solving your turning problems.

SENECA FALLS MACHINE CO., SENECA FALLS, N.Y.

PRODUCTION COSTS ARE LOWER WITH Lo-swingy

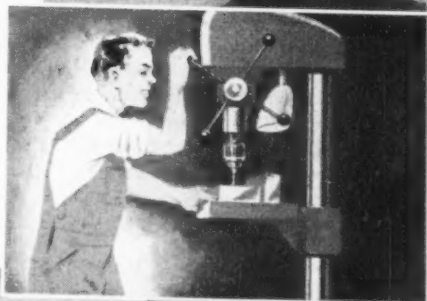


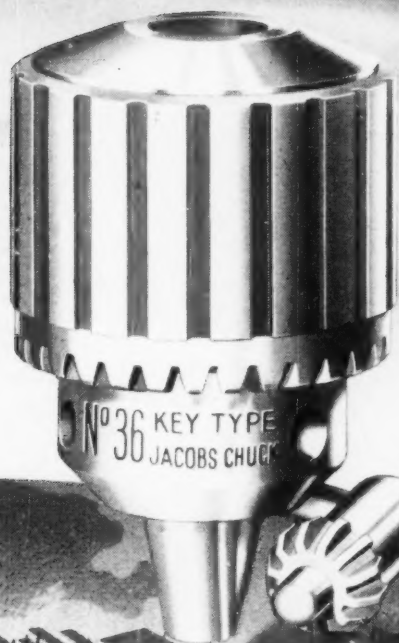
SUPER BALL BEARING
For Your Heavy Duty Drilling

The frictionless tightening permitted by its ball bearing construction gives this rugged chuck the world's tightest grip.

When drilling tough metals under heavy duty conditions, insist on Jacobs Super Chucks to eliminate tool slippage and to reduce drill breakage.

Jacobs Ball Bearing Super Chucks and Plain Bearing Chucks are stocked by your nearby Industrial Supply Distributor. The Jacobs Manufacturing Company, West Hartford 19, Connecticut.





PLAIN BEARING

For Your Medium and Light Work

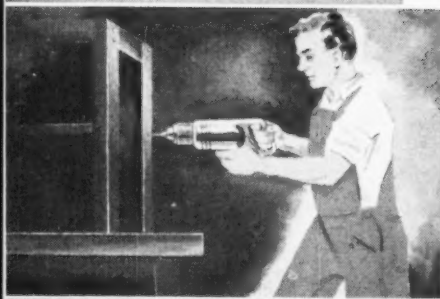
The most widely used drill chuck in the world today. Its rugged design and construction assuring precision performance over a long service life come from 47 years of experience in manufacture.

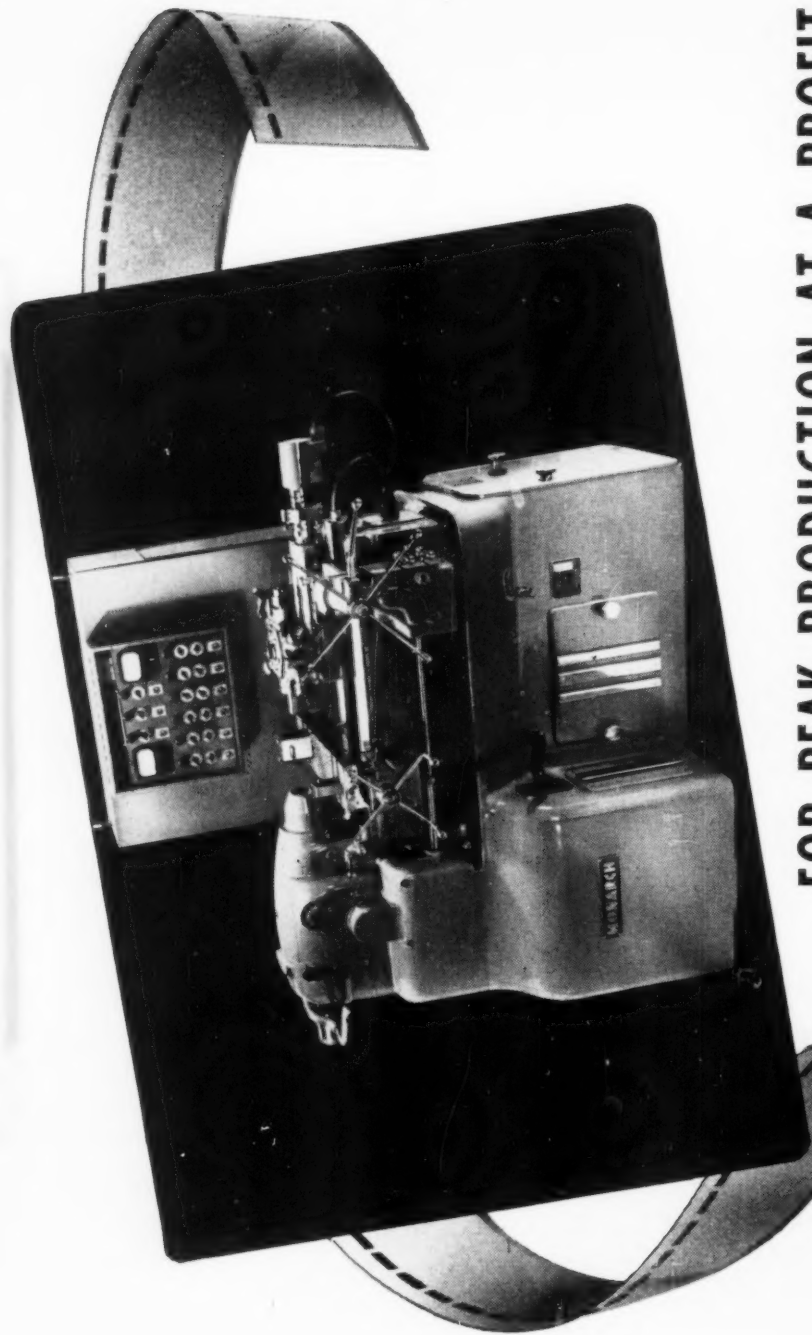
That's why makers of drill presses, pneumatic and electric portable tools insist on Jacobs Plain Bearing Chucks as original equipment.



If it's a JACOBS, it holds

Jacobs Chucks





**FOR PEAK PRODUCTION AT A PROFIT
invest a few minutes in**

THE

SPEEDI-MATIC

A 23 MINUTE
SOUND MOTION PICTURE
(16 MM.)

PRESENTED BY

**THE MONARCH
MACHINE TOOL CO.**

SIDNEY, OHIO



Monarch
TURNING MACHINES

THIS FREE FILM

"World's Fastest Hand Screw Machine"—that's what metal turning experts, everywhere, are calling the Monarch *Speedi-Matic*. It operates so fast, so accurately you have to see it to appreciate it.

Because you may not be able to spare the time for a trip to Sidney to see the *Speedi-Matic* demonstrated in our own showrooms, we've put its operation on film, ready to perform for you in your own office or assembly hall.

Into the brief space of twenty-three minutes we've packed eleven complete examples of its time-saving, money-saving performance on typical steel and bronze screw machine parts. And there's enough description of the *Speedi-Matic's* outstandingly unique design features to explain why it can make "peak production at a profit" a reality in your shop.

To secure the loan of a free print of this interesting and valuable new film, fill in the coupon below and mail to us, attached to your letterhead. Be sure to supply all requested information. That will help insure definite reservation for use at a time suitable to you.

The Monarch Machine Tool Co.
Sidney, Ohio

Please book your twenty-three minute, 16 mm. sound film, "The Monarch *Speedi-Matic*", for use on

Showing Date _____ Alternate Date _____

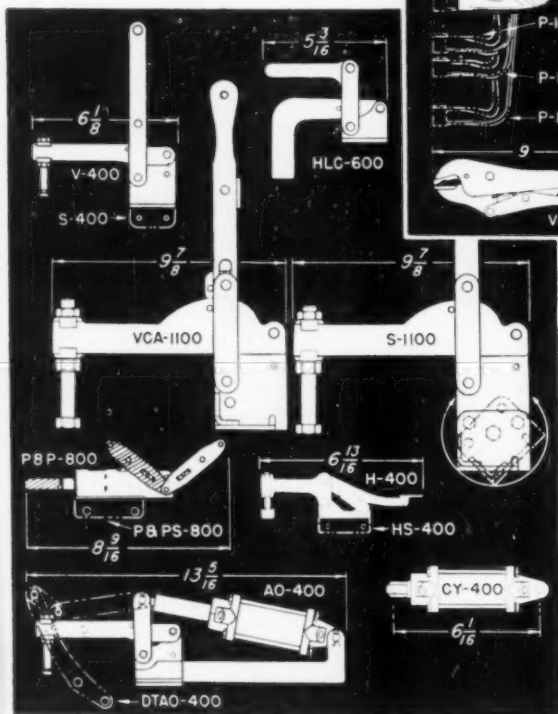
Organization _____

My Name _____ Title _____

Street Address _____

City _____ State _____

There's a LAPEER Clamping Device to meet your every clamping need



**—unmatched for rugged
use, dependability, speed
and long service**

The extensive line includes toggle-action type, fixed and portable and air-operated models. Set for predetermined pressures, these LAPEER clamps and pliers provide quick bull-dog grip and instant release.

Exhaustive tests in laboratory and years of practical use have made these LAPEER devices the choice of the leading manufacturers for applications in drilling, grinding, welding, and in all operations requiring fast and reliable clamping.

Recognized as clamping engineers, we can give you much valuable assistance on any set-ups involving the clamping and holding of parts during processing. Let us help you; our engineers will gladly discuss your clamping problem at your plant.

Consult our representative engineer near you:

Chern, V. A., New York 17, N. Y.
Duer Equipment Co., Columbus 2, O.
Grimes, W. F., Dayton 2, O.
Jackson-Walter Co., Phila., Pa.
Larry P. Wood, Chicago 20, Ill.

Maehlenpach Engineering, Inc., St.
Louis 10, Mo.
Stoffregen, K. W., Milwaukee 9, Wis.
C. G. Wilson Co., Dallas, Texas
J. H. England, Buffalo, N. Y.

Send for complete catalog. Templates on request.

**KNU-VISE
PRODUCTS**

LAPEER MANUFACTURING CO.
3056 DAVISON ROAD • LAPEER, MICHIGAN

WESTERN DIVISION • 422 MAGNOLIA ST. • GLENDALE, CALIFORNIA

W. O. BARNES CO., INC. HAND AND POWER HACK SAWS—BAND SAWS

A CHIP off the Old Block



We Know
You'll Think So
When You Try The

RED ROCKET



IT'S BARNES' NEW POWER HACK SAW BLADE

The Red Rocket combines increased toughness and flexibility for high production cutting at low operational costs.

The Red Rocket stands abuse when subjected to excessive feeding pressure and it is suitable for machines not in the best mechanical condition. Blade breakage is practically eliminated and danger of shattering is negligible — an extremely desirable safety feature.



Established
1919

W. O. BARNES CO., INC.

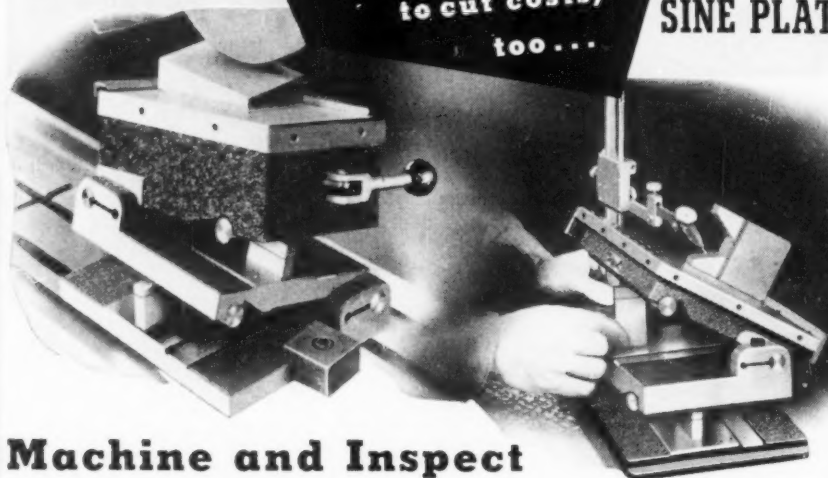
1297 TERMINAL AVE.

DETROIT 14, MICH.

MAGNA-SINE

**For positive angular
accuracy...
to cut costs,
too...**

SINE PLATE



Machine and Inspect Angular Work by the Same Method

By using the magnetic Robbins Magna-Sine for machining operations and the non-magnetic Robbins Sine Plate for inspection, you can be sure of every angular dimension. Both units are precision units, set up with standard gauge blocks by the sine bar method. To determine the gauge blocks to use for any given angle, the operator merely checks the handy Table of Constants supplied with every unit.

There is no possibility for false errors to appear due to the difference in set-ups between process and inspection . . . hours of

set-up time are saved in both departments because the most complicated of angles can be set up in minutes with either of these units.

The Magna-Sine is equipped with permanent magnet chuck which clamps or unclamps the work in an instant by turning a handle . . . work is held securely without distortion. The top plate of the Sine Plate has tapped holes so that the work can be held for precision inspection without magnetizing the part. Write today for descriptive bulletins and prices.



OMER E. *Robbins* COMPANY

Manufacturers of the MAGNA-SINE and Other Precision Tools

5722 Twelfth Street • Detroit 8, Michigan

*Why HUNT RABBITS
with a TANK?*



**on Most Jobs a KRW 100-TON PRESS WILL
EQUAL HEAVIER, COSTLIER, EQUIPMENT**

and SAVE YOU MONEY!

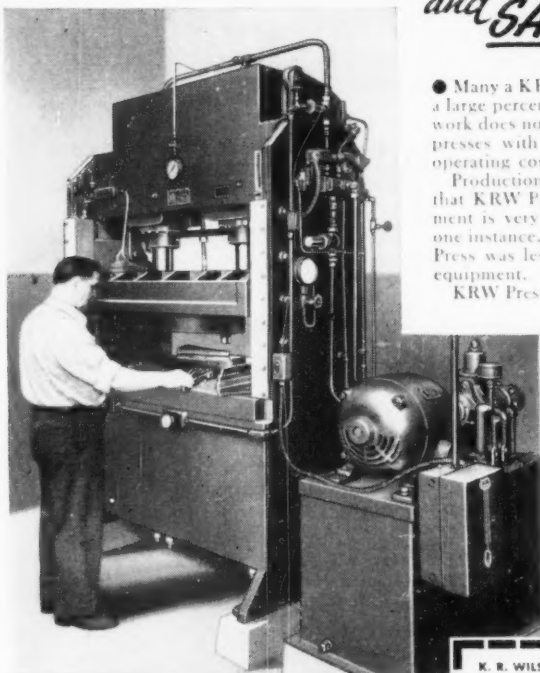


Illustration shows a KRW 100-Ton Hydraulic Press in plant of Elrae Pressed Metals, Inc., Buffalo, N. Y. When the picture was taken, bicycle parts were being formed.

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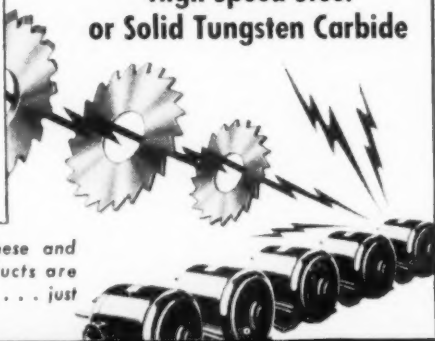
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
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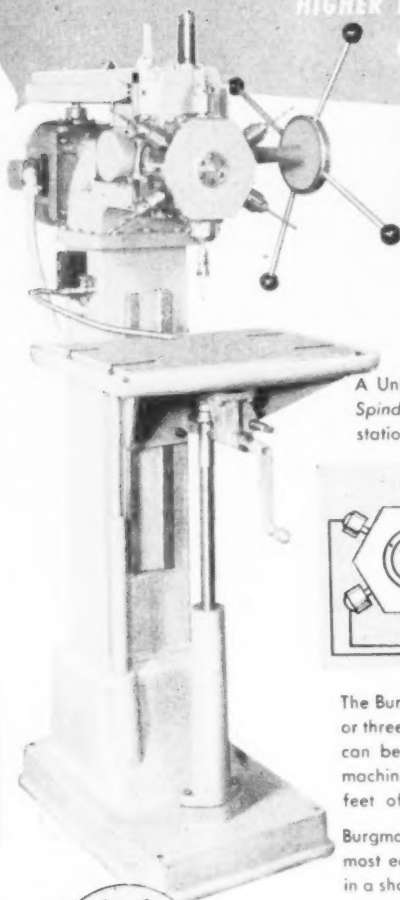
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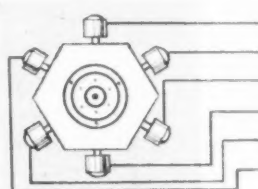
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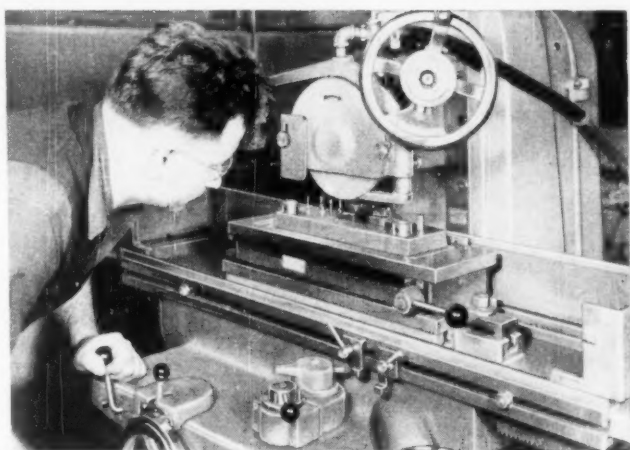


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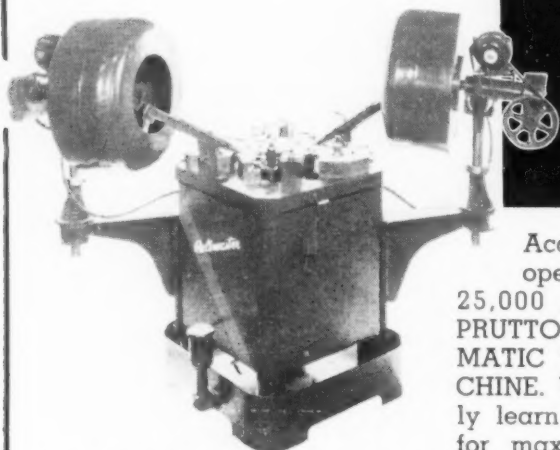
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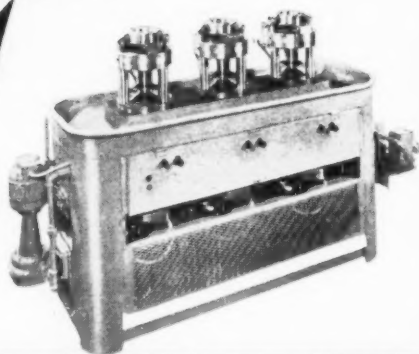
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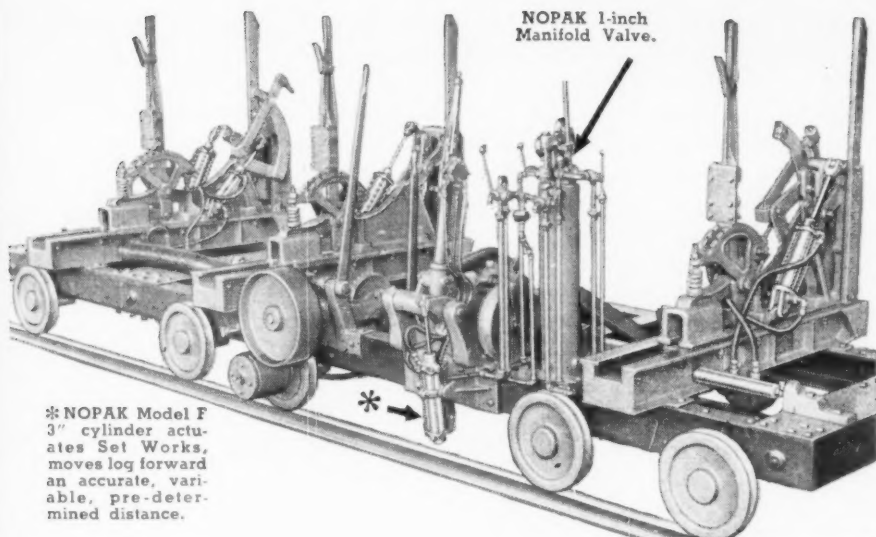
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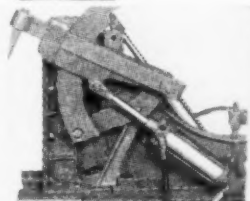
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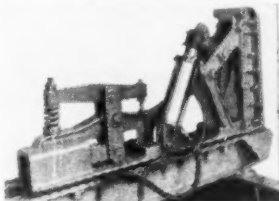
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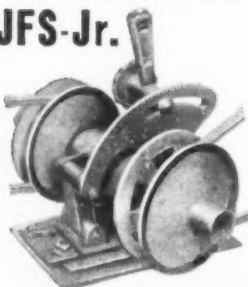
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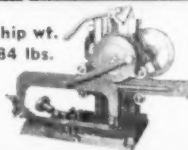
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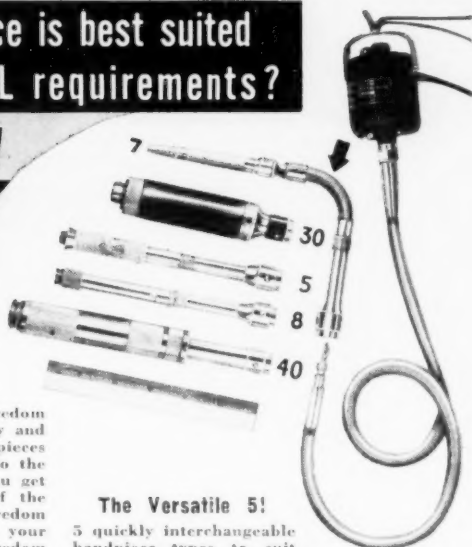
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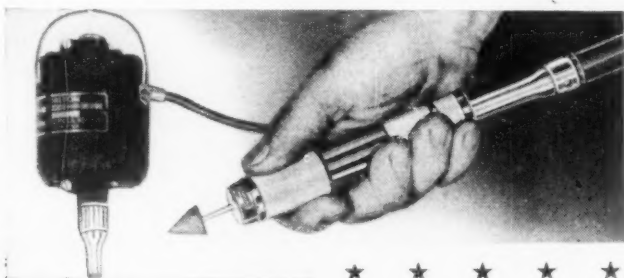
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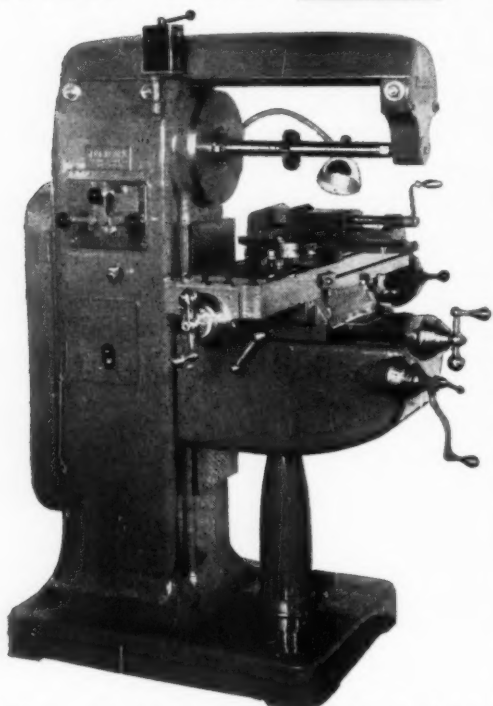
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Larger table optional.

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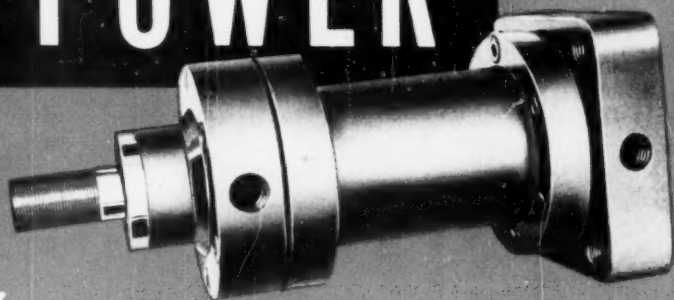
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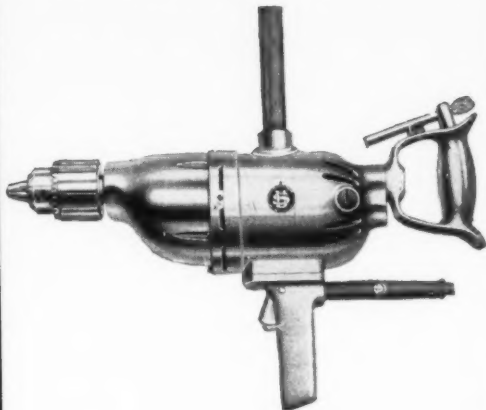


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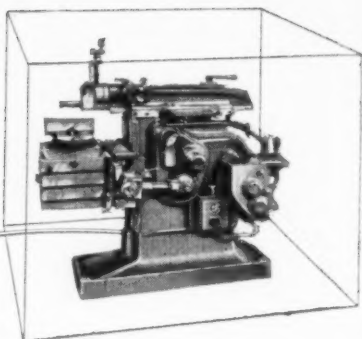
The above set-up is a typical example of what can be done with MODERN Magic Quick Change Chuck and Collet equipment. Here, four spindles of the machine, equipped with MODERN Magic Chucks, perform twenty-eight separate operations.

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Featured in ... this issue ...

HOW'S BUSINESS? Production charts, spot news of business activity, review of surveys and forecasts, and trends of domestic business conditions will be a regular monthly feature of the Machine and Tool Blue Book. Beginning in this issue. Page70

THE USES AND APPLICATIONS of Single- and Multi-Spindle Automatics, by Ralph A. Warren. This is the first of a series of articles on the operation and use of automatic screw machines. Mr. Warren has had over 50 year's experience as a consulting engineer, primarily on automatics. His series will be factual, practical and down-to-earth. Page77

THE CLAMPING OF CYLINDRICAL COMPONENTS, by Paul Grodzinski. The author is one of the world's leading authorities on diamond tools whose material has appeared in the Blue Book. In the present article Mr. Grodzinski draws on his past experience to present this article on holding devices. A supplementary article will appear in the February issue. Page89

REDUCE COSTS WITH POWER CHUCKING, by H. L. Stewart. More and more metalworking plants are using power chucking to speed loading and unloading operations, always an important cost factor. The types of equipment available, and interesting illustrations of equipment in use, round out an authoritative article. Page101

METHOD OF COST CONTROL, by Kent Worthmore. A certified public accountant takes a look at some of the cost control methods which may be used to systematize,

and so make more efficient, present day accounting methods. Page117

LETTER FROM ENGLAND, by Robert Hutcheson. Page123

ECONOMIC FORECAST FOR 1950 presents the results of a survey made by the Dodge Corporation. This fact-finding organization is highly respected for its impartial and authoritative business analyses. Page131

SHOP DISCIPLINE . . . SIGN OF LEADERSHIP, by Edmund Mottershead. Another in a current series on foremanship management. The right and wrong kinds of shop discipline and methods of gaining worker cooperation and confidence without resorting to disciplinary actions are discussed in this installment. Page139

VIEWS FROM HERE AND THERE. For those who like their news in pictures this is the first appearance in the Blue Book of a new picture section. Page148

MODERN TOOLS in Action. Page152

SHOP HINTS. Page156

AVAILABLE LITERATURE. Page160

WHAT'S NEW IN METALWORKING. Page199

PRODUCTS INDEX. Page280

ADVERTISERS' INDEX. Page286

CORRECTION. In last month's issue we announced the appearance, this month, of an article on tooling practices at Minneapolis-Honeywell. Unfortunately, due to circumstance beyond our control, the article will not be featured at this time.

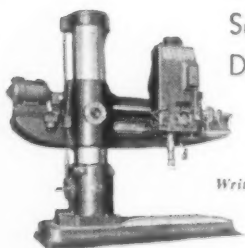
INTERESTING READING NEXT MONTH

Reducing Metal-Removing Costs
Tooling Single- and Multi-Spindle Automatics
Production at Lindemann & Hoverson Company



It's all done here

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- 2** Eighteen feed changes are instantaneously made by two adjacent levers—on the head.
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- 5** Power rapid traverse of head in either direction by single lever—on the head.
- 6** Start, stop and reverse spindle by one lever—on the head.



Equal Efficiency of Every Unit
Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

As the **editor** **SEES IT**

IT'S COSTLY TO BE OLD

The amazing improvements made in metalworking equipment in the last two decades is equalled only by the phenomenal production increases and lowered costs reaped by the progressive manufacturers who installed these mechanical geni on the production line. Some of our more respected shops would not merit anybody's applause for high caliber work had they not engaged the help of new methods, speedier techniques and better machines. Yet, when confronted with the visible result of cost dollars saved and production hours gained, to say naught of manpower conserved, it is wondrous to note, on the other hand, the dexterity with which some shops sidestep modern machines and techniques. Such agility in dodging the benefits of new ideas and time saving production equipment belongs on the dodgeball field and not in a 1950 manufacturing plant.

The writer recently concluded several sorties into eastern, southern and middle western shops where he witnessed the intelligent use of streamlined mechanized equipment as well as stumbled over and gazed spellbound at ancient American museum pieces. One shop harnessed the expensive manpower of fourteen girls to perform deburring operations, using elbow grease and files . . . a small speed lathe with one operator would have been the answer. A manufacturing executive cried over the high cost of doing business; yet all his equipment was powered by overhead drives which wrestled with slow and bearded grandads of the good

old days. In another shop, four men, arranged in a row like toy soldiers, performed a drilling operation on a casting. The first operator drilled one hole, passed the casting to the next who drilled the second hole, then passed the casting to the third and fourth for two more drilling operations. When asked about the advisability of installing a multiple drill press, which would drill all four holes simultaneously, the works manager shrugged his shoulders . . . "these things cost money."

With the whirlwind advances made in carbides, moss-backed conceptions of speeds, feeds and work-holding devices have been carefully labeled and tucked away by modern shops as the relics of a dead era. Yet in shop after shop carbides were shunned like rare 5-legged zoological specimens having no business in a machine shop. Another plant surfaced small aluminum gear housings in a milling machine when a wet belt surfer could have upped their production tremendously.

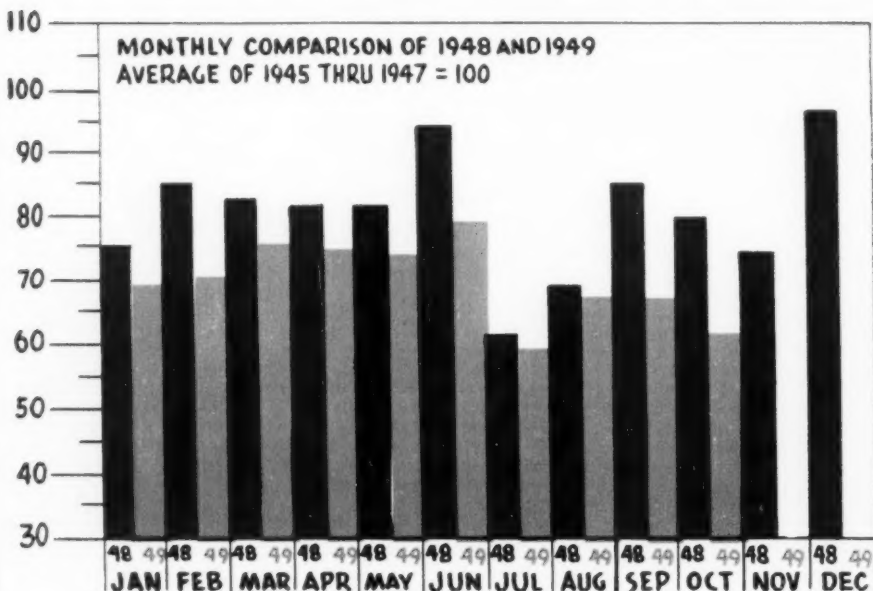
If the coming year accomplishes little else but jar some metalworking executives into cognizance of the necessity of installing modern production machinery, the year will be a success. It is difficult to believe that shops now tussling with museum machines will be unaffected by demonstrations of latest equipment and will remain immune to the advantages to be derived from the purchase of latest machine tools.

William F. Schleicher

HOW'S BUSINESS?

MACHINE TOOL SHIPMENT CHART

An indexed quantity comparison between 1948 and 1949



source: National Machine Tool Builders

1950 TO BE A GOOD YEAR

Many industrial equipment manufacturers are looking forward to 1950 as a good production and sales year.

1. C. E. Wilson, president of General Motors, "We are looking forward to good business next year and are making plans now to produce cars and trucks at the same or even higher level than this (1949) year".

2. Dun & Bradstreet survey on business men's expectations for the first quarter of 1950 revealed that 70% expected the same increased sales volume. For another, more detailed survey, see "The Economic Outlook for 1950" a feature article in this issue.

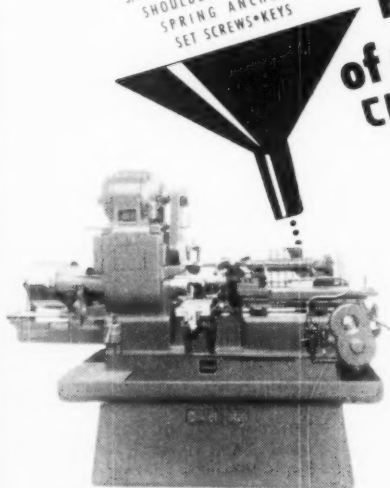
3. Lloyd D. McDonald, past president of the NMTBA, expects an increase in machine tool sales to replace equipment of war and pre-war vintage.

4. Washington, D.C.—It is expected that 30 millions of dollars will be set aside for purchase of equipment and machinery for the arms-aid to Europe. ECA grants to England, for the purchase of U.S. machinery, amount to 8½ millions. France will get 5¼ millions.

5. Independent surveys received by this office show the same optimism for the machinery business that Dun & Bradstreet showed for business in general. The ASTE survey reported in these pages further bears out this general opinion.

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COMPANIES TO BUY MORE IN 1950: ASTE SURVEY

A national survey of projected 1950 purchases of new machine tools, machine tool accessories, materials handling equipment, etc., completed by the American Society of Tool Engineers reveals that 80% of companies reporting state they plan to buy either more equipment or the same amount as in 1948.

Larger companies show the biggest increase in planned purchases. 79% of the companies say their 1950 purchases will exceed those of 1948. Only 7% said they would buy less.

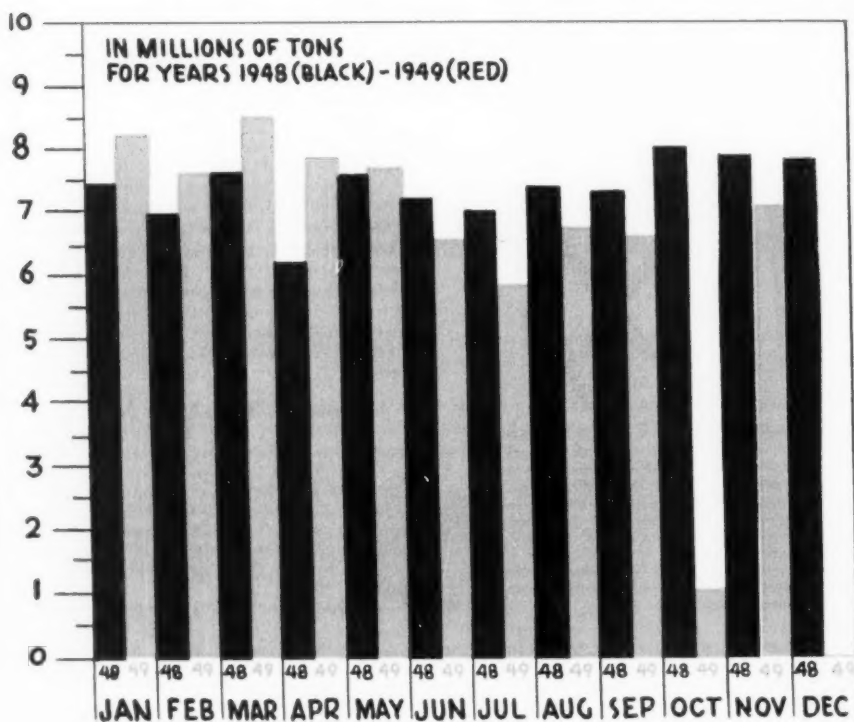
Medium-sized companies plan the following purchases: 55% plan to buy the same as in 1948; 29% plan to buy less; 16% plan very few purchases.

Small companies' totals are as follows: 28% will buy more; 50% will buy in the same amounts as in 1948; 22% will buy less.

For all companies the totals show:
45% will buy more than in 1948.

TOTAL STEEL PRODUCTION CHART

A quantity comparison between 1948 and 1949



source: American Iron & Steel Institute



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Cutters — B-C Tantung-Tipped Slab Mills, $4\frac{1}{2}$ " x 4" x $1\frac{1}{2}$ "

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Cutter Speed — 175 RPM

Tool Life — 250 pieces per sharp.
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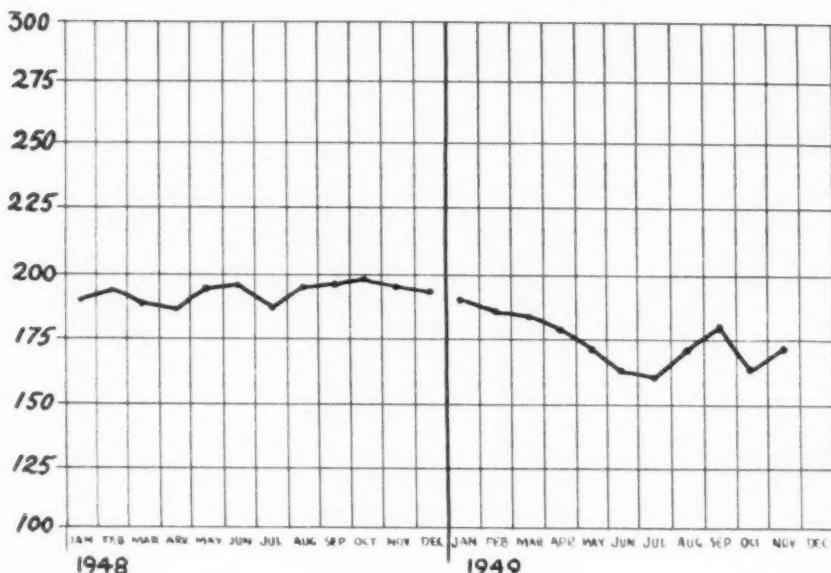
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TOTAL INDUSTRIAL PRODUCTION INDEX for 1948 and 1949



base: 1935-1939=100

source: Dept. of Commerce

35% will buy about the same amount.

7% will buy less.

13% will buy very little.

Reasons for buying are as follows:

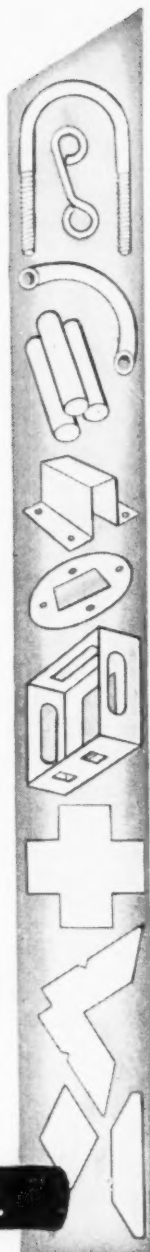
New machines to reduce cost	64%
Modernizing present equipment	64%
Replacement of equipment	54%
New materials handling equipment	27%

The analysis further reveals that 52% of the companies will spend largest portion of their budgets for new machines to cut costs; 26% will spend most of their budgets in modernizing existing equipment (automatic devices, higher speed operation, loading and unloading tools, etc.); 12% say their largest outlay will be for the replacement of obsolete equipment; 10% plan to spend their budgets on materials handling materials.

Reports from Detroit indicates that 1950 will be a good year. Shops in this area are benefiting from the optimistic outlook in the automobile industry. Automatic transmission jobs for Ford and Studebaker will help the general picture. Rumors have it that K-F will come out with an automatic transmission. The majority of auto companies have recovered from the steel strike and are planning all-out production

for 1950.

Optism for 1950 is in the air. This is all to the good. But let no one be deluded into thinking that business will be plucked off the trees. Smart merchandising, a shirt-sleeve effort to increase production, increased sales and advertising efforts, are necessary; and above all, fear must not stifle initiative and plans in progress. A Happy New Year.



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THE USE AND APPLICATIONS OF

Single-and Multi-Spindle Automatics

by Ralph A Warren*
Consulting Engineer

This is the first of a series of articles dealing with the efficient use and applications of automatic machines. The author, for over 50 years a consulting engineer who has made a specialty of tooling for these machines, will discuss the various types of jobs which can be performed. He will also discuss the types of machines best suited for each job.

WHAT IS IT that makes an automatic screw machine job payoff?

Opinions on this question will be widely divided, and a more or less formal exchange of views has failed to provide any fixed rules that can be applied. Almost every screw machine job can be run in several different ways, and finding the best is usually a problem in mathematics.

After fifty-two years spent entirely with the industry as an engineer and part time operator, the writer knows of only one factor that enters into all screw machine jobs; SURFACE FEET PER MINUTE. And it's SURFACE FEET PER MINUTE that governs costs.

With the steadily increasing use of graphical charts, diagrams etc. in most branches of engineering, and especially big business, it appears about time to abandon theory and approximate ways in favor of some sort of measuring stick that can be applied to each individual movement; in other words, make certain the job will be run within the estimated seconds per piece then figure the price per thousand pieces accordingly.

Space does not permit a thorough explanation of graphical figures necessary to determine exactly how many cam spaces are needed for tool clearances, indexing spaces in relation to deep drops, and other idle movements; without their use there is nothing

* Author of Warren's Book on Automatic Screw Machine Engineering.

left to do except use the approximate tables regardless of maximum allowances and lower net production rates.

Let me suggest the re-reading of the Brown & Sharpe manual. It offers a clear understanding of their machines and contains many approximate tables that will help the beginner unfold some of the complicated problems in all automatic screw machine jobs.

It is known these tables are offered as a guide only. A job laid out in accordance with them will run smoothly, but it will contain more or less lost time due to maximum clearances having been provided. These tables do not represent the high production rates machines are capable of delivering. Higher rates come with close timing.

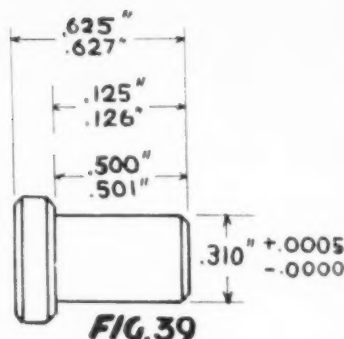
First let us study the thing called surface feet per minute and find its relation to the automatic screw machine job. An object moving in any direction is said to be moving at a rate of so many feet per minute. Suppose a railroad train to be traveling a mile a minute, then it's moving past a fixed point at the rate of 5280 feet per minute; the same principle applies to the screw machine and the fixed point is the cutting tool.

A suggested number of surface feet per minute pertaining to screw machine stock has been determined by actual cutting tests, for example: a box tool bit may cut freely 6 or 8 hours at a speed up to 225 feet per minute, but if a drilling operation is included in the order of operations the speed will need slowing down to about 150 feet, otherwise the drill would burn before the first hole was completed.

This is a case of sacrificing speed of one cutting tool to protect the tool life of another. There are many times such conditions will appear, and failure to consider them is one cause for more seconds per piece and higher operating costs.

The foregoing sounds good on paper; now let us see how it works out in practice. For example see Fig. 39.

First, check the print for kind of material and stock diameter, at the same time check tolerances closely and possible cutting tools, then write up a temporary order of operations.



**B-1112 MAT. .437" DIA.
BREAK CORNERS .015" x 45**

It has been suggested that B-1112 stock will cut freely up to 225 feet per minute and up to about .010" tool feed per spindle revolution. This does not mean all cutting tools will stand that amount of speed nor does it mean all tools will take that amount of feed, they are offered as a guide only from which to determine suitable speeds and feeds.

Since there are no tools among the temporary order that need favoring we accept the suggested 225 feet and proceed to find a spindle speed in relation to material and stock diameter.

At this point of the procedure some may wonder why we bother with surface feet when it's spindle speed we want; the fact of the matter is, we can't find one until we know the other.

In case there are no tables at hand use the following rule; first multiply the stock diameter by .262 and use the result as a base number, then multiply the base by trial numbers until the result equals the wanted surface feet or close to it. This will be a round about way but it will do until something better is at hand.

For example: .437" x .262 x 2000 r.p.m. = 228 s.f.p.m. It seldom happens that result equals the wanted feet, nor does it always match one of the listed spindle speeds; unless one is thoroughly familiar with cutting tools it's best to use the next lower speed.

Surface feet will increase in numbers in direct proportion to increased stock diameters; a one inch bar revolving at 2000 r.p.m. will be moving at the rate of 524 feet, therefore a suitable speed must be found for each change in stock diameters.

It should be remembered suggested surface feet numbers are offered as a guide; in some cases they may be increased, in others decreased, it will all depend on kind of tools, what you intend making the tools do and depth of cut.

Now that we have a suitable speed and enough other information we begin to study ways and means of making the piece.

On account of small stock diameter and short over all body length, the No. 00 HS. machine appears best suited.

At first glance this looks like a form and cut off job, i.e., cut off one piece while forming another, but the close body size prohibits use of any of the conventional form and cut off methods. To be reasonably sure of acceptable finished pieces the body should be finished by box tool, then use a cross slide form tool to break corners and face outer end.

If we continue in the usual way we would feed to turret stop. Then index box tool near cutting position, or up to .010" approach. After completing the

box tool travel it's necessary to index the turret around to next feed out position; in this case we use a method needing no indexing and proceed with approximate ways and means.

The HS. OO machine requires $\frac{1}{4}$ seconds running time for feeding of stock. This $\frac{1}{4}$ second represents running time that must be provided while the mechanism completes the mechanical movements necessary for feeding of stock or indexing of turret. It is known as predetermined time and must always be considered.

Since all movements must be represented by spindle revolutions, the next move is to convert this predetermined time into spindle revs, then add extras. In this case 11 revs. will do.

The temporary order of operations is sufficient, but when the operations are many and varied sometimes 6 or 8 orders must be written up before finding one that offers a high net production rate and smooth cam action.

We total the est. rev. column and find 445 revs. and 5 zeros. These zeros represent cam spaces that must be allowed for idle movements. Until a graphical figure has been drawn up it's impossible to know how many spaces will be required or how many spindle revolutions they represent; therefore, we can only suppose the 445 revs. equal the other 95 cam spaces.

Temporary order, Layout No. 1.

B-1112 Material, .437" dia., 2000 r.p.m.
Time: 15 secs.

Operations			Est. Revs.	Act. Revs.	Cam. Hwds.
Feed to swing stop.			11	10	2
Clear swing			5	5	1
Adv. Box tool.			0	25	5
Box tool travel.	.510	.010	51	50	10
Box tool dwell.			0	5	1
Clear Box tool.			0	30	6
Form .224"	.200	.002	100	100	20
	.024	.0005	48	50	10
Form dwell			0	5	1
Cut off .260"	.150	.0015	100	90	18
	.090	.001	90	85	17
	.020	.0005	40	40	8
Clear			0	5	1
			445	500	100



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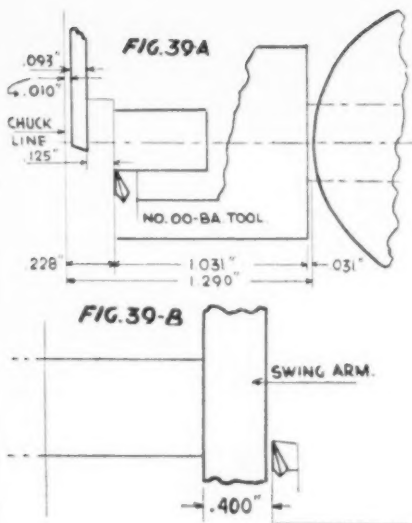
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Next procede as outlined in Fig. 39-A. First draw the chuck line, then allow about .010" clearance for tool chips and draw the cut off tool, then draw work piece.

At this point of the procedure, the least distance must be considered; it has been explained when the turret has advanced to its extreme forward position the distance between the turret

and chuck line is known as the least distance (LD). This distance is expected to provide sufficient space for turret tool movements without interference; if it doesn't then more space can be had by means of cam cut down, turret slide adjustment or both.

The LD space on the 00 HS. machine is 1⁷/₈". It can be seen that the work piece projects out from chuck line .728", this means that amount of LD space is already occupied. Next draw the No. 00 BA. tool positioned at end of turret travel. This tool will finish .228" back from chuck line, next add the over-all length of tool plus whatever amount projects out from turret; the total equals 1.290". This amount is well within the LD space and as far as tool working room is concerned, no cut down is required.

Fig. 39-B shows the swing arm in position and the BA. tool .400" back from work piece. When the arm has cleared the tool is then advanced through .400" rapid cam rise into near cutting position and the planned tool travel starts at that point.

The next move is to find how many revolutions are necessary to complete 100 cam spaces at the estimated rate and then proportion them around the cam circumference in relation to each of the individual operations. See Layout No. 1.

Layout No. 2

B-1112 Material, .437" dia., 2000 r.p.m.
Time: 12 secs.

Operations			Est. Revs.	Act. Revs.	Cam Hwds.
Feed to swing stop			11	10	2.5
Clear swing stop			5	6	1.5
Advance BA. tool			0	20	5.0
Box tool travel	.510	.010	51	48	12.0
Box tool dwell			0	6	1.5
Clear Box tool			0	24	6.0
Form .224"	.200	.002	100	96	24.0
	.024	.0005	48	48	12.0
Form dwell			0	6	1.5
Cut off .260"	.150	.0015	000	000	00.0
	.090	.001	90	90	22.5
	.020	.0005	40	40	10.0
Clear			0	6	1.5
			324	400	100.0

By rechecking the layout it can be seen that separate running time has been allowed each operation. In some cases such conditions are necessary, but before accepting them it's best to re-check for possible overlapping of tools, thereby reducing the running time per piece.

With this type of order, the first 5 must be run as shown; beginning with No. 6th., and in accordance with the approximate tables, 6 spaces must be allowed before either cross slide tool can be moved into position; in other words, enough spindle revolutions representing 6 spaces must take place while the cutting tools are standing still; these

revs. are simply a loss of time and part of them cannot be avoided.

The same conditions exist through Layout No. 2, beginning with operation 7 we over lap the first cut off rise with the first form rise. Since the form rise must travel .200" through 100 revs., while the cut off travels only .150" through the same number of revs., it's safe to over lap and save 100 running time revolutions.

It can be seen no cut off revs. for the first rise are written into either est. or actual column, instead they are shown as 25 over lapped cam spaces, see Fig. 39-C.

Fig. 39-C represents a super-imposed cam drawing; in other words, syn-

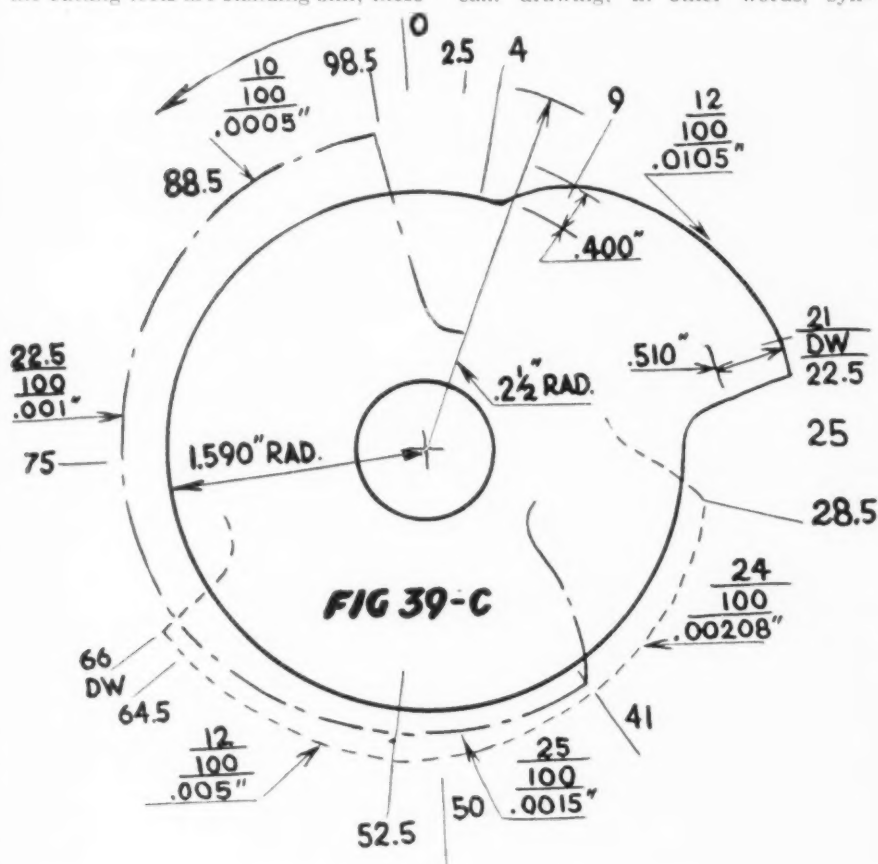
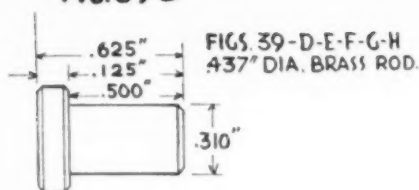
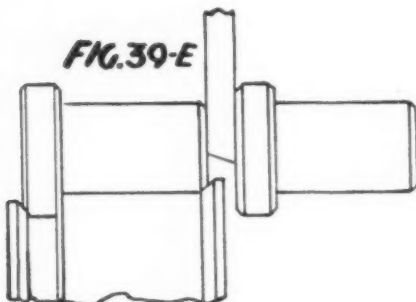
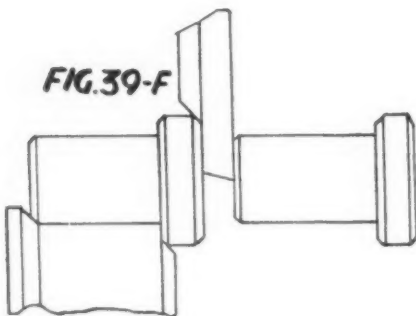
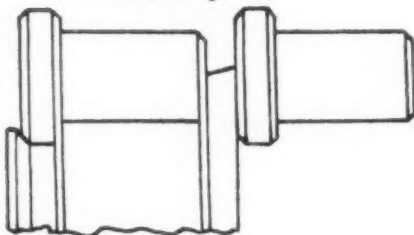
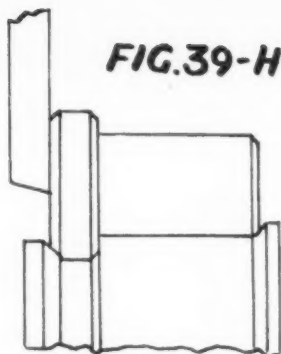


FIG. 39-D**FIG. 39-E****FIG. 39-F****FIG. 39-G****FIG. 39-H**

chronized cam cycles. Beginning O, the swing stop arm automatically drops into position, the collet opens and the stock is fed out 0 to 2.5. From 2.5 to 4 the arm clears, and from 4 to 9 the BA tool is advanced through rapid cam rise into near cutting position. From 9 through 21 the tool travels through .510" rise, then dwells 21 to 22.5. At this point of the cam circumference the turret slide moves back in the direction of arrow 2, and is held in dwell until time to move into position.

In accordance with the B & S approximate tables, it's not safe to move either cross slide tool until revolutions representing 6 cam spaces have taken place, by then the turret is supposed to have cleared and the tool can be moved into cutting position without danger of interference. Therefore, we allow 6 cam spaces, (most of these 6 spaces represent wasted running time) 22.5 to 28.5, then start the first form rise of .200" through to 52.5. At this point we slow down the feed and continue the second rise of .024" through to 64.5, then dwell 64.5 to 66.

At the 41st cam division, the first cut off rise of .150" starts and continues through 66, these are over lapped and are not written into the running time. They represent cutting time without charge; the engineer should be quick to take advantage of such conditions. They mean less revolutions per piece and lower operating costs.

Fig. 39-D is similar to Fig. 39 both in shape and size with the exception of tolerances; they represent the average

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rivet or other pieces of the same nature, it is strictly a form and cut off job.

There are four commonly used methods of making this piece and probably a half dozen other ways. Figs. 39-E-F-G and H represent four of the most used ways.

Fig. 39-E is the most practical and offers the highest production rate; the head will vary slightly in length on account of feeding out after forming, also a small burr may form on the head due to rapid cut off travel, but such things seldom make any difference on rivets and other similar pieces; the running time for B-1112 material would be less than half that of Fig. 39.

This series of 12 articles, which will appear in the Blue Book will offer

comparisons between Figs. 39-E-F-G and H, also more text on various other operations; new tooling and use of attachments. The manner of approach and methods used follow closely those of Warren's 1945 Book, beginning with the older multi-spindle machines on through the late model 6 & 8 spindles. A comprehensive view of their operating factors will unfold clearly multiple spindle inter-related operating cycles.

No attempt will be made to compare operating movements between any of the multiple spindle machines; each has operating principles that make one kind of machine different from another; therefore special work piece parts will be selected for each make of machine.

MARSHALL STEEL CO., MOVES, EXPANDS FACILITIES



Marshall Steel Company, formerly of Lisle, Illinois, has recently moved to its new building in McCook, Illinois, just outside of Chicago. This expansion was necessary to increase the present facilities and provide a broader service throughout the entire country.

A large group of Mattison Grinders enables the new plant to produce ground flat steel of three types: water quenched, oil quenched and air quenched, better known to industry as Watercrat, Oilcrat and Aircrat, "the aristocrats of ground tool steel."

Marshall Steel Company is now better equipped to produce special precision grinding jobs, such as shear blades, wear plate, machine parts, etc. The central location of the new plant enables the firm to ship ground flat stock quickly to any part of the country.

The firm has also issued its latest catalog, giving all of the sizes and heat

treating information for the above-mentioned steel. Companies interested in obtaining this catalog, or further information regarding the firm's products, are invited to write Marshall Steel Company, Box 108Q, McCook, Illinois. The new telephone number is Lawndale 2-1330.

EARL REINHART

Earl F. Reinhart of Michigan City, Ind., president of Republic International Co. of N. Y. and long prominent in the tool and machinery business, died October 20th in New York.

Mr. Reinhart also served as vice chairman and a director of Avildsen Tools and Machines, Inc., of Chicago and previously had been president of Republic Drill and Tool Co. from 1940 to April 1949. He was a member of the War Production Board in 1942.

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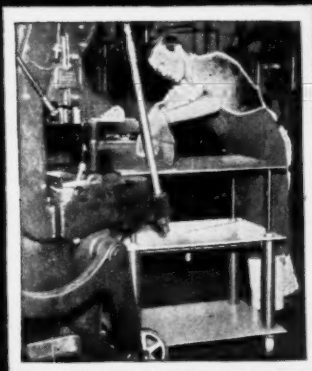
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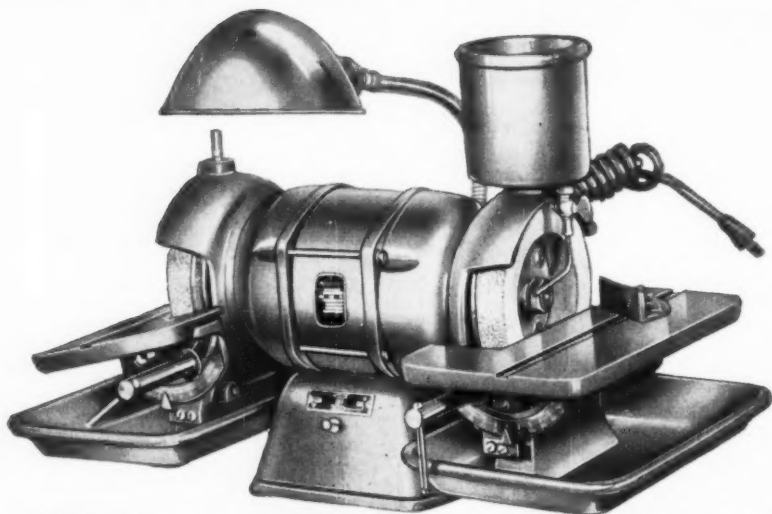


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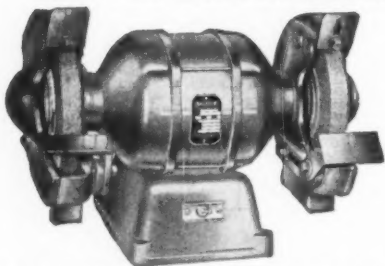


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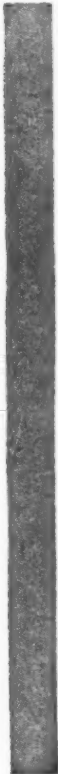
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THE CLAMPING OF

Cylindrical Components

by Paul Grodzinski, A.M.I. Mech. E.



This well known engineer, besides being highly respected in his profession, is also an international authority on diamond tools. The Blue Book is happy to present Mr. Grodzinski's views on clamping of cylindrical components. A supplementary article on the same subject will appear in the February issue.

CYLINDRICAL bars and shafts have frequently to be clamped i.e., they have to be held by friction in a distinct position whereby axial or tangential forces cannot effect relative movements between the connected exponents. Examples are represented by cylindrical shafts in boring bars, clamping of collar rings, bar material in automatic machines, clamping of cylindrical guiding bars in instruments and machines, etc.

Similar to other clamping purposes are also the usual clamping devices: wedge, screw, eccentric, clamping by spring action and utilizing the flexibility of the material. The three mechanical clamping means, or elements: wedge, screw and eccentric form a special group. Fig. 1 shows the clamping of a cylindrical tool shank in a boring bar by means of a wedge. In reality the wedge consists of a cylindrical pin flattened on its lower side. The shaft is also provided with a flattened portion, to prevent its rotation about its axis. The shaft can only be adjusted in the range permitted by the flattened portion.

When clamping by means of screws it has to be distinguished between the direct and indirect clamping. The direct clamping by means of screws cannot be considered as a very effective method, and should be confined to inferior or auxiliary purposes. Fig. 2 shows in a somewhat exaggerated manner what happens if a bar is clamped directly by a screw. During

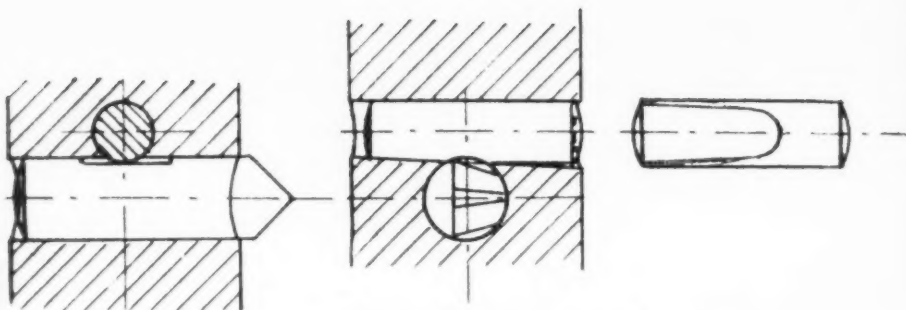


Fig. 1. Clamping a cylindrical bar by means of a wedge-shaped component.

use the diameter difference between hole and bar will increase, and the center of the latter becomes set eccentrically. Further, owing to this diameter difference the bar can assume different positions in sideways directions; in order to prevent this action the top of the bar has been flattened. It is an improvement to use two screws, Fig. 3, under an included angle of 120 deg. This gives a so-called three point support and fixes the bar in a distinct position, but this does not prevent an eccentric displacement, which can be overcome only by using three screws, as shown in Fig. 4.

The following illustrations show some applications of direct acting screws, under the assumption of close fitting components. In Fig. 5 the fixing of a collar to a shaft by means of a cone-point screw is shown. The cone-point

hole should be drilled into the shaft before the fitting. This is a very rough method and only to be recommended where a permanent fitting is desired.

To prevent the damage of shafts and shanks, etc. by direct acting screws, and the risk of an eventual displacement during fine adjustment between the screw end, preferably dog-shaped, and the shaft, a pressure pad consisting of a soft metal, such as brass, copper or aluminum should be provided, Fig. 6. In any case the rotating movement of the screw end, which causes the large wear markings seen on unprotected tools, is avoided in this case. Fig. 7 shows the pad in an enlarged view; its diameter should be somewhat smaller than the core diameter of the female thread in order to be inserted through the screw hole.

The above mentioned rocking move-

Fig. 2. Clamping by means of a screw; conditions exaggerated.

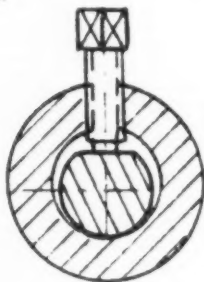


Fig. 3. Clamping by means of two screws.

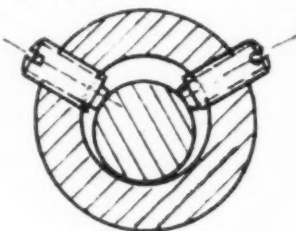
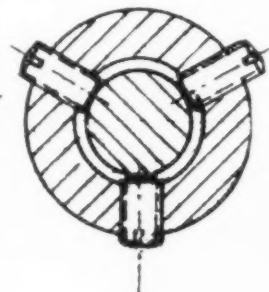


Fig. 4. Clamping by means of three screws.



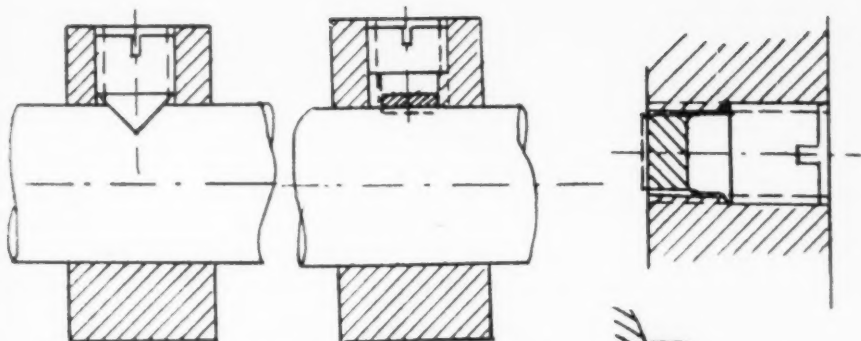


Fig. 5. (Right) Securing a collar by means of a con-head screw.

Fig. 6. (Center) Clamping a shaft by means of dog-end screw and a soft pad.

Fig. 7. (Left) Enlarged view of Fig. 6.

ment of a bar in a larger hole may be excluded by placing the bar into a vee—or prism groove, Fig. 8. This solution is similar to the holding of a work-piece in a lathe dog. If we double the vee-grooves, ie., place the cylindrical component between two members provided with vee-grooves, we obtain an effective clamping action in which the screws are already acting indirectly, Fig. 9. The same principle may be used with only one clamping screw and by replacing the vees by circular recesses in both components, Fig. 10. Owing to the split shape any clearance between bar and outer member is safely avoided; the pressure is distributed over nearly

the whole circumference of the cylindrical bar. The so-called pad-block or pad-bolt design, Figs. 11 to 18 and 29, can be considered to represent conversions of this idea, whereby the clamping blocks or chocks have received a cylindrical shape. This principle is very useful. In all these cases the block is securely guided and therefore the abutment, shown in Fig. 10 can be dispensed with.

Fig. 11 shows a simple form useful for outer members of cylindrical or oblong shape. The pad-bolt consists of a cylindrical block fitting in a recess of the same diameter in the main body. The clamping is performed by a tension

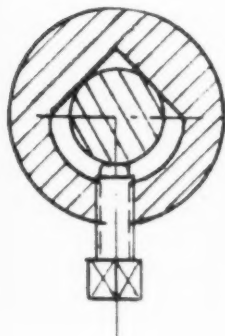
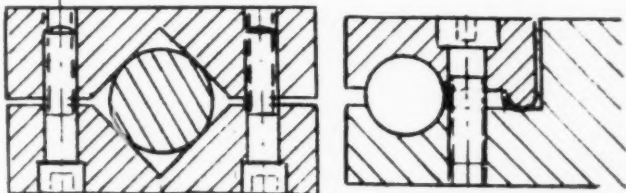


Fig. 8. (Left) Placing the bar in a vee-groove and clamping by means of a dog-end screw.

Fig. 9. (Center) Clamping a cylindrical bar between two components with vee-grooves.

Fig. 10. (Right) Clamping by means of a cover plate.



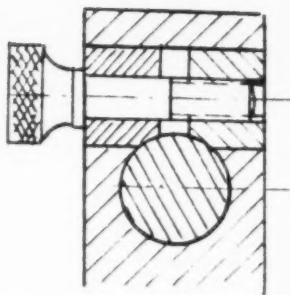
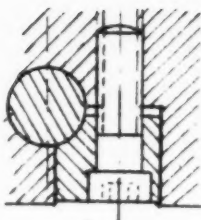
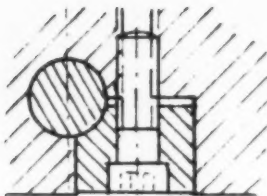


Fig. 11 (Left) Simple pad-bolt device, central arrangement.

Fig. 12 (Center) Simple pad-bolt device, eccentric arrangement.

Fig. 13. (Right) Double pad-bolt device.

screw, the female threads being placed in the outer member. The pad-bolt in Fig. 11 is central, but in Fig. 12 the screw is arranged off-center, so that space is saved. If not accurately machined, the pad-bolt tends to bring the bar out of center, this is prevented at

least for one direction in a design according to Fig. 13. Here the tension screw fits into a nut, which serves as a second pad-bolt acting from the other side to the bar. A still more improved shape is shown in Fig. 14, where an absolutely perfect centering action is ef-



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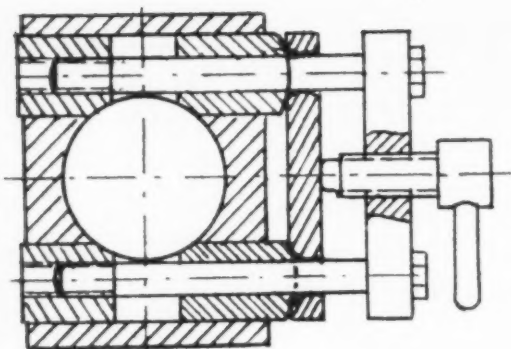
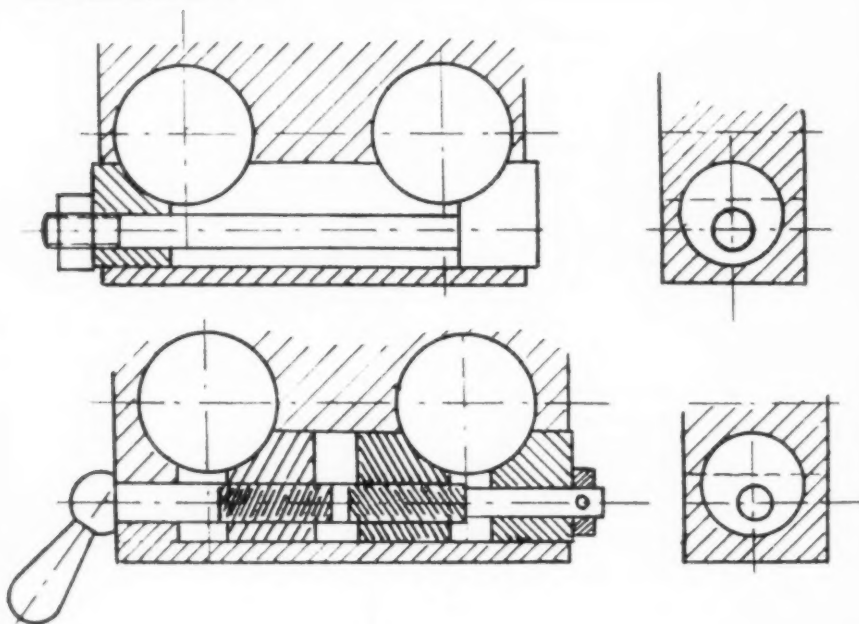


Fig. 14. (Top) Two pairs of pad-bolt actuated by one screw secure a centre adjustment.

Fig. 15. (Center) Clamping of two parallel bars by two chocks, operated by one nut.

Fig. 16. (Bottom) Clamping of two parallel bars by two chocks, with right and left hand thread.



ected by two pairs of pad-bolts. These are actuated by one pressure screw acting on a pressure plate which abuts on the ball shaped heads of the right hand chocks. The tension bolts are clamping screw is provided in a bar connected by tension bolts with the left hand chocks. The tensions bolt are shown as stud-bolts, but may be one piece with the left hand chocks.

The same clamping principles may also be applied for the simultaneous clamping of two parallel bars by means of a single lever. In Fig. 15, the pad-bolts are pressing from the outside, in an arrangement similar to Fig. 13, but reversing or exchanging screw and nut. In Fig. 16 the pad-bolts are acting from the inside and are operated by right and left hand threads. The chock

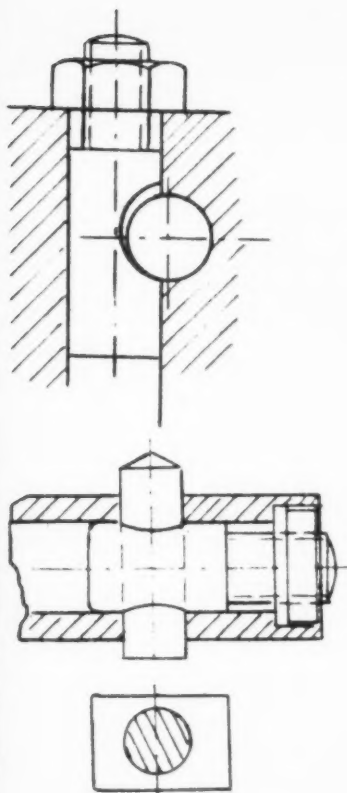
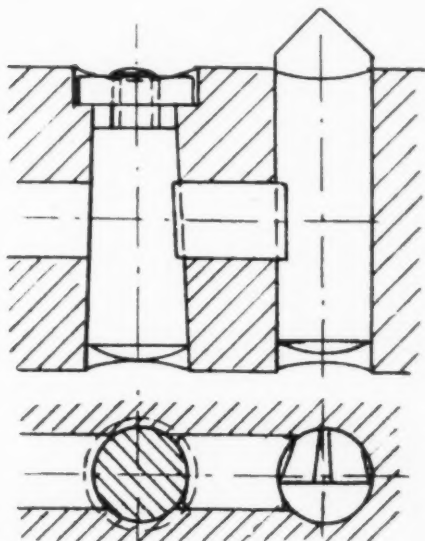


Fig. 17. (Top Left) Another modification of the pad-bolt design.

Fig. 18 (Bottom Left) Improved form of pad-bolt design.

Fig. 19. (Bottom Right) Clamping by means of cone pin, nut operated, and cylindrical pad.



on the extreme right hand side serves only for the guiding of screw bolt and place. The advantage of this design is that the handle is situated in the outer member, or housing.

Another design based on the same principle is to use a cylindrical bar with a circular recess, with a radius corresponding to the bar to be clamped, Fig. 17. The cylindrical bolt is provided with a threaded end and the clamping is effected by a nut. Fig. 17 shows, somewhat exaggerated, the difference between the recess and the bar to be clamped, demonstrating that there is only a small area of contact between both components. This can be considered as a disadvantage of this design which otherwise saves some

space as the distance between the center of bar and bolt can be smaller than, for instance, in the case of Figs. 11 and 12.

An improved shape is shown in Fig. 18, where the pad-bolt is provided with a transverse hole corresponding to the diameter of bar to be clamped. A longer area of contact, compared with the hitherto shown designs, is present; this can be considered as a very reliable method.

Fig. 19 shows the clamping by means of a conical pin provided with a threaded end and nut. The clamping is performed by means of an intermediate cylindrical pad; this represents a suitable method also for the simultaneous clamping of two bars, and is useful for

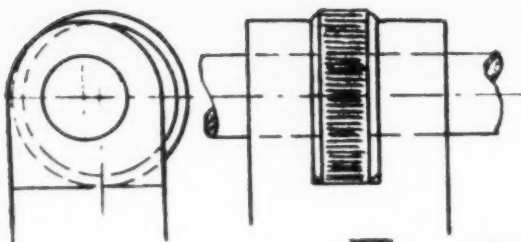


Fig. 20. Simple eccentric clamping.

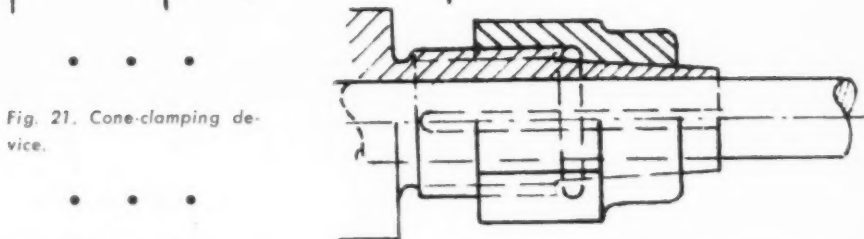


Fig. 21. Cone-clamping device.

multiple tool boring bars.

Fig. 20 shows an ingenious method utilizing a hollow eccentric disc for the clamping of a cylindrical bar; this is a very simple solution, but only applicable for inferior purposes. Fig. 22

shows the clamping by means of an eccentric shaft pressing on an intermediate cylindrical pad. Here the same applies as in the case of Fig. 19, i.e., that two shafts may be clamped simultaneously and multiple tools can be

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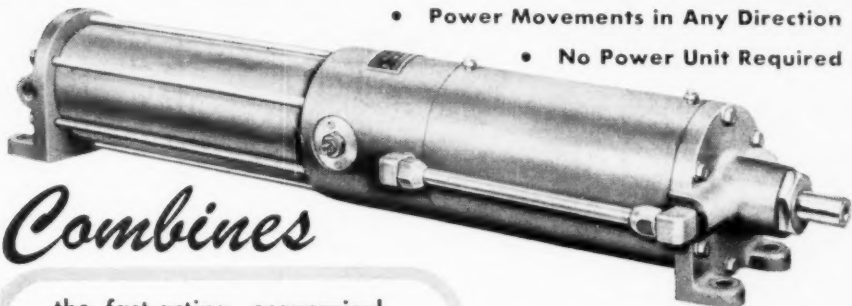
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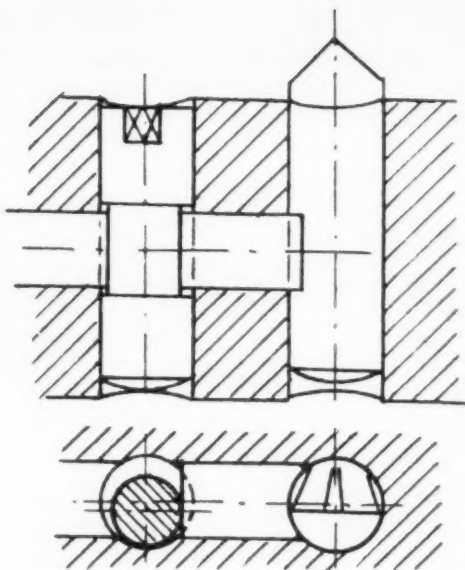
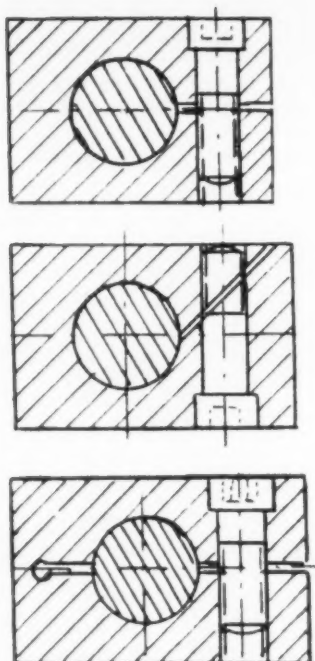


Fig. 22. (Right) Eccentric shaft and cylindrical pad.
 Fig. 23. (Top Left) Split body with transverse slot.
 Fig. 24. (Center Left) Split body with inclined slot.
 Fig. 25. (Bottom Left) Split body with extended slot.

clamped by separate shafts along one boring bar.

Fig. 22 shows the cone-clamping or collet chuck principle in a simple design. More elaborate means are applied for the clamping and releasing of cylindrical work pieces in bar automatics, but the description of these designs is not within the scope of this article.

In the following some examples will be given for the pinching or clamping by means of the flexibility of the material. In these cases always an additional clamping element has to be provided, to ensure the clamping action; besides screws, as shown in the following, also eccentrics, wedges and other clamping means are applied. As in these cases, Figs. 23 to 29, the friction force can be assumed to extend over the whole circumference of the bar to be clamped, a larger torque will be necessary to cause a relative movement between inner and outer member, there-

fore, a better clamping action can be assumed. Diameter differences owing to inaccuracies in manufacture and wear can be compensated within certain limits. A reduction in the width of slot of s in. causes a diameter contraction of s/π about $1/3 s$; for instance a slot reduction of 0.06 in. causes a diameter contraction of about 0.02 in. This calculation is based, however, on a full flexibility of the outer member, which will only be present if the outer member consists of a flexible band.

In Fig. 23 the outer component is provided with a small transverse slot which gives only a small amount of flexibility. In Fig. 24 an inclined slot is used giving a better flexibility in the case of the oblong shaped body. The flexibility is further increased in Fig. 25, where the slot is extended to both sides. Fig. 26 shows an improved principle, as besides the tension screw, a clamping screw is applied, making the

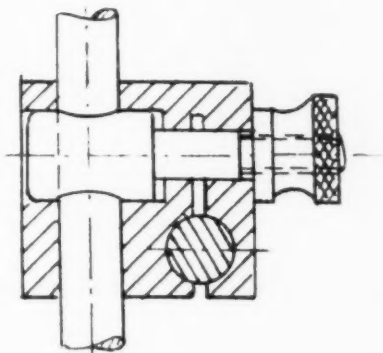
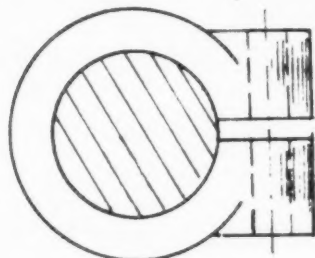
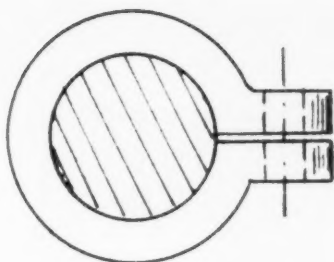
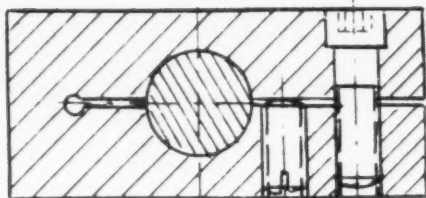


Fig. 26. (Top Left) Split body; tension and clamping screw arrangement.

Fig. 27. (Top Right) Simple form of split clamp.

Fig. 28. (Bottom Left) Split Clamp for cast, forged or pressed bodies.

Fig. 29. (Bottom Right) Combination of pad-bolt and split body for a clamping device for height gauges.

connection independent of the flexibility of the outer member. This principle has proved useful for the height adjustment of bearings in instruments, as well as for the adjustment of gauges.

In the hitherto shown illustrations the outer component was of oblong shape, but in practice according to the chosen material and the size of bar other shapes are eventually more common. Fig. 27 shows a simple clamp made of sheet metal or a bent steel strip. If, however, the component is cast, forged or pressed a shape according to Fig. 28 may be recommended. The projections for the screw are to be

made as strong as possible in order to avoid any deformation or stress on these parts. All necessary deformation should take place on the ring shaped part. In Fig. 29 the principle of clamping by means of flexibility of the material is combined with the clamping principle according to Fig. 18 for the purpose of clamping two bars, one perpendicular to the other; this device represents the clamping of the needle in height gauges.

The End.

A second, or supplementary article, on this subject will be presented in the February issue of the Blue Book

Appointment of **Joseph B. Dietz** as manager of the industrial sales section of the Finishes Division of the Du Pont Co., Wilmington, Del., has been announced. He succeeds **Henry E. Lackey**, who is retiring after a career of nearly 43 years. Other changes in the Finishes Division include **William P. Fisher, Jr.**,

who comes to Wilmington as assistant manager of industrial sales. **William E. Kreuer** is transferred to Chicago as regional industrial sales manager. **Richard N. Sanger** is appointed industrial sales manager at Cleveland. **Walter S. Woods, II.** is appointed industrial sales supervisor at Cleveland.



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Lower operator fatigue, constant gripping power on work pieces, faster chucking, lower maintenance costs, and high gripping power result from the use of power chucking. Some of the various types, as well as advantages, of power chucks are discussed by the author.

by H. L. Stewart, Logansport Machine Co.

IN SPEAKING of power chucking equipment, reference is made to that type which is powered by air or hydraulic means. If powered by air, the air compressors which serve the entire plant will be the power source, whereas, if powered by hydraulics, the power source will be small hydraulic power devices which will serve one installation or one group of installations. Occasionally, a central hydraulic accumulator is used to serve a large portion of the hydraulic equipment in the plant.

Power chucking equipment is usually considered a must on new high production machine tools, such as lathes, grinders, boring machines, large vertical drilling machines and many special purpose machines.

Tool engineers are also adapting power chucking equipment to many old production machines which formerly were equipped with manual chucking equipment. Horizontal type machines, such as lathes, grinders and boring machines are very easily converted if the hole thru the spindle of the machine is of sufficient size to take the drawbar which connects the power cylinder to the chuck. A chuck adapter and cylinder adapter is then mounted on the spindle to accommodate the chuck and cylinder respectively. On vertical type machines such as milling machines and large drill presses, power operated chucking devices can readily be attached without many changes.

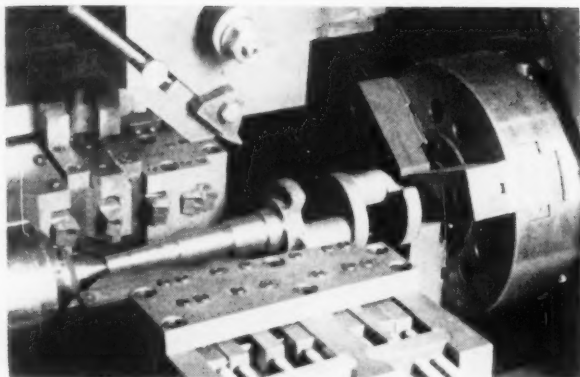


Fig. 1. Air operated, three jaw Universal Chuck showing false jaws in gripping position. Notice numerous cutting tools with inserts for heavy duty work.

Power chucks and power chucking devices are manufactured in many types and styles. These devices can be divided into four groups.

A. Power chuck for lathes, grinders and boring machines. This group is made in several different styles:

1. Universal, two and three jaw.
2. Combination, two and three jaw.
3. Serrated, two and three jaw.
4. Compensating, two and three jaw.
5. Duplex, four jaw combination.
6. Indexing, two jaw.
7. Finger type, three jaw.
8. Two-in-one, two and three jaw.
9. Box type, two jaw.

B. Power operated mandrels. Each mandrel is usually designed for one particular application. Nearly all mandrels are used on tubular pieces such as shells, cylinder

sleeves, bearings, etc. Power operated mandrels are made in two, three, four and six jaw styles. Some are equipped with work locaters and hardened work stops. Mandrels prove invaluable on work pieces with a long overhang.

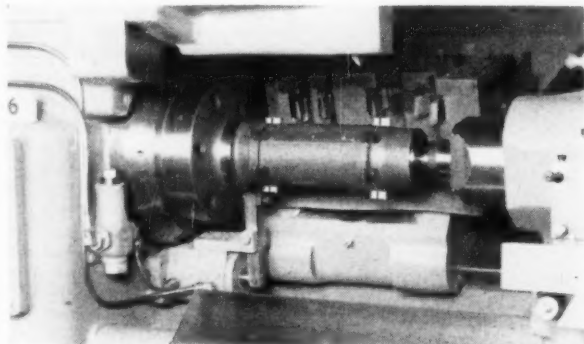
C. Collet type chucks. This group is listed as follows:

1. Closed center for short work pieces.
2. Open center for long work pieces.
3. Skeleton for high speed spindles.

D. Drill Press Chucks. These are made in both the open and closed center type and are usually a self contained unit. These units contain the chuck, power cylinder and operating valve. On installations where much cast iron dust or small metal shavings are encountered, the device is usually equip-

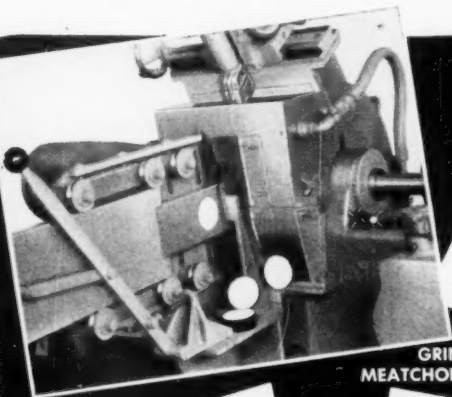
Fig. 2. Air operated mandrel with two sets of jaws.

This machine is also equipped with an air operated tailstock.



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Surface Parts**

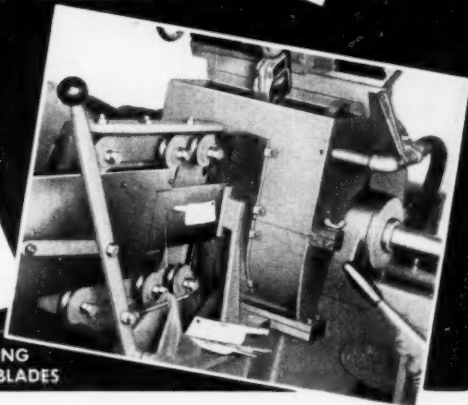


**GRINDING
MEATCHOPPER BLADES**

WORK DATA	
Part	Meat-chopper Plates
Material	Steel
Operation	Grind two Parallel Sides
Tolerances	.001" Parallelism
Stock Removal	.003"-.004 Uniformity Overall
Production	75 to 100 Per Hour
Feed	Hand Load and Unload To Roller Run-Type Fixture
Machine	No. 14A-20" Gardner Grinder

WORK DATA	
Part	Cleaver Blades
Material	Steel
Operation	Grind two Parallel Sides
Tolerances	.002"-.003" Parallelism
Stock Removal	.010" to .015" Maximum Overall
Production	3 to 4 Pieces Per Minute
Feed	Hand Load and Unload To Roller Run-Type Fixture
Machine	No. 14A-20" Gardner Grinder

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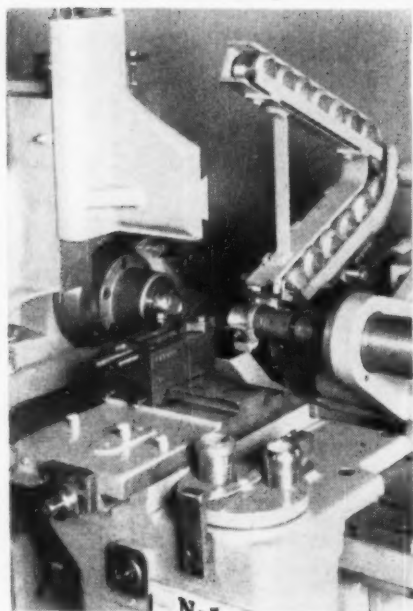


Fig. 3. Air operated collet chuck. High production machining is accomplished by the use of air and the automatic feeding arrangement.

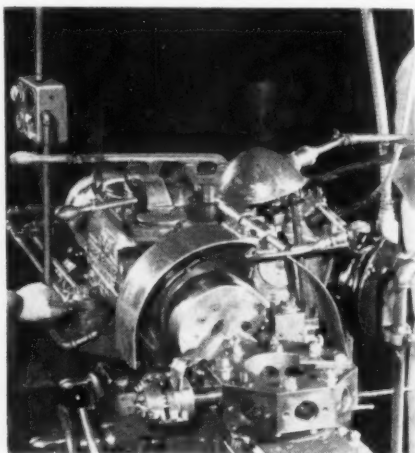


Fig. 5. Air operated, two jaw chuck for holding fittings on high production operation on a Warner & Swasey No. 2. Note die heads on turret.

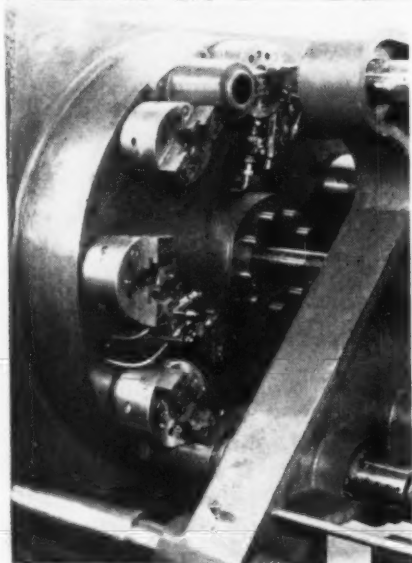


Fig. 4. Hydraulically operated two jaw chucks on special indexing machine. Note the hydraulic valving near the chucks.

ped with dust seals or boots. Drill press chucks are used on heavy drilling machines where high pressure gripping of the work piece is necessary.

Numerous advantages are derived from the use of air or hydraulic chucking equipment:

(1) **Less Operator Fatigue:** In conducting time studies on like machines except for the chucking equipment, the results showed that operators using air or hydraulic chucking equipment showed far less operator fatigue than those using manually operated chucking equipment. With the use of air or hydraulic equipment, the operator can merely push a button or step on a foot pedal and he has the full power at his command, whereas, with manually operated chucks, it is sometimes necessary to use a long piece of pipe on the end of the chuck wrench along with all the strength he can muster in order to tighten the chuck's jaws sufficiently to

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finer finish

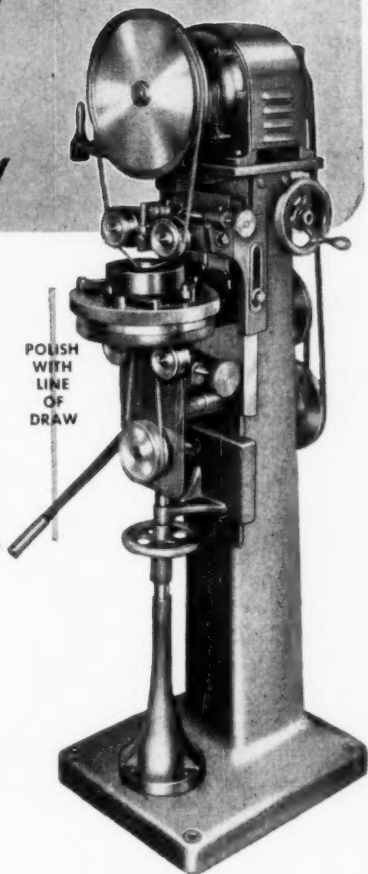


This abrasive belt method polishes dies parallel with the line of draw of work through the die. A finer mirror-like finish is imparted to the die which results in a better and finer finish to the work. Machine is adjustable to prevent bell mouting of the discharge side of the die if necessary.

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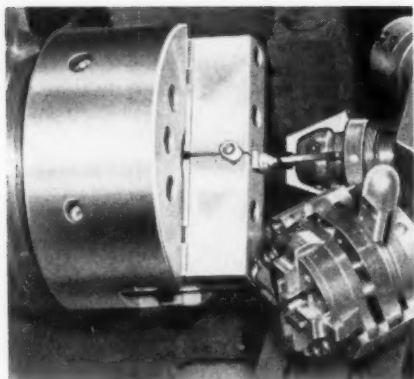


Fig. 5A. Closeup of same operation.

hold the work when taking extra heavy work.

Power operated chucks are especially popular in plants using women operators. During the past war, many machines would have set idle if it were not for the power chucking equipment which enabled many plants to use women operators.

(2) Always the same gripping power on work piece: The gripping pressure on a manually operated chuck is entirely dependent on the operator's strength or judgment, whereas, on the power operated chuck, it is always uniform. With the manually operated chuck, if the operator becomes tired or careless, he may not chuck the piece tightly and it may fly out of the chuck, damaging the piece, break the cutting tools and injure the operator or another workman.

(3) Power chucking is much faster: Tests run on round pieces, light enough to be lifted into the chuck by hand showed the following chucking times:

Chuck Size	Manual Operation	Air Operation
6"	.25 minutes	.05 minutes
8"	.35 "	.10 "
10"	.45 "	.10 "
12"	.5 "	.10 "
15"	.8 "	.20 "
18"	.8 "	.20 "

(4) Low Maintenance: With the minimum amount of care, air or hydraulic chucking equipment will give many

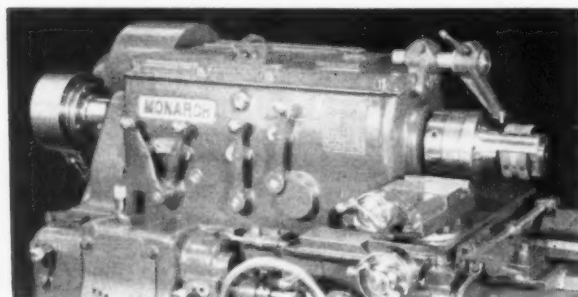


Fig. 6. Air operated mandrel with wide jaw pads.

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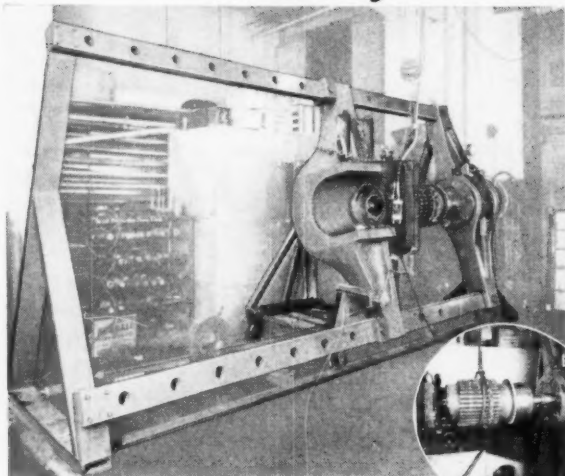
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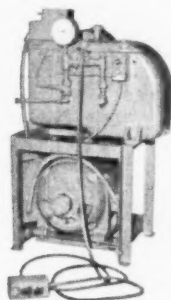
Rodgers 300 Ton, 75° Inclined, Stationary Forcing Press, one of many in the complete Rodgers line. In the application shown, the press is being used efficiently to press an armature shaft.

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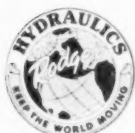


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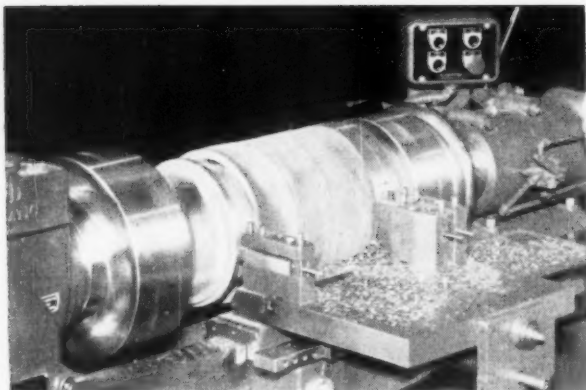


Fig. 7. Special lathe using two sets of air chucking equipment for holding large engine cylinder liners.

• • •

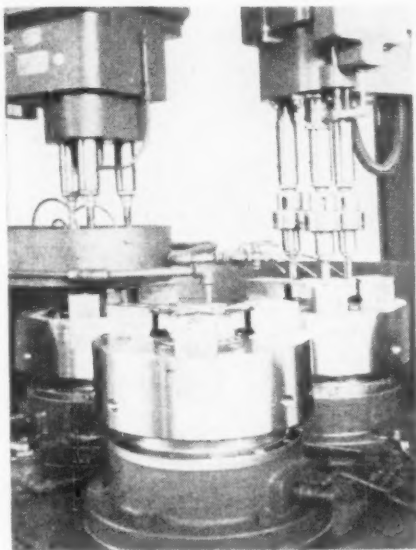
Fig. 8. Air operated drill press chucking equipment on special high production machine. Note that air cylinder is built into base of power chuck.

years of rugged service. Many air chucks have been in use for fifteen to eighteen years and are still giving very satisfactory service.

The chucks should be lubricated and cleaned at regular intervals. If the chucks are being used to machine cast iron or other metals which cause a great amount of dust, they should be disassembled occasionally and completely cleaned.

(5) Reserve movement is always present when needed: In hand chucking, if the work piece is chucked on a burr or a rough spot on a casting, then when the tool bites into the work, slippage often occurs and the work piece is loosened in the chuck, causing tool breakage or scrapping of the piece. With the power chuck, there is always reserve movement to pick up any irregularities.

(6) High gripping power assured:



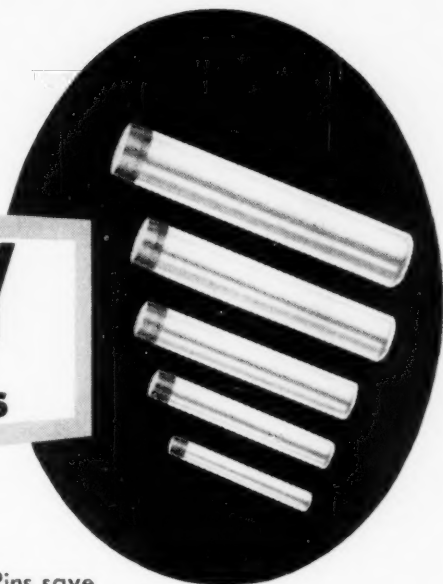
THREE-JAW CHUCKS

Size of Chuck	Size of Cylinder	Lever Ratio in Chuck	Theoretical Clamping Force at 80 lbs. Pressure
6	4 $\frac{1}{2}$	2 to 1	2544 lbs.
8	8	2 $\frac{1}{4}$ to 1	9047
10	8	2 $\frac{3}{8}$ to 1	9549
12	12	2 $\frac{7}{8}$ to 1	26013
15	14	3 $\frac{3}{8}$ to 1	41563
18	16	4 to 1	64340
21	18	5 to 1	101750
24	20	5 to 1	125660

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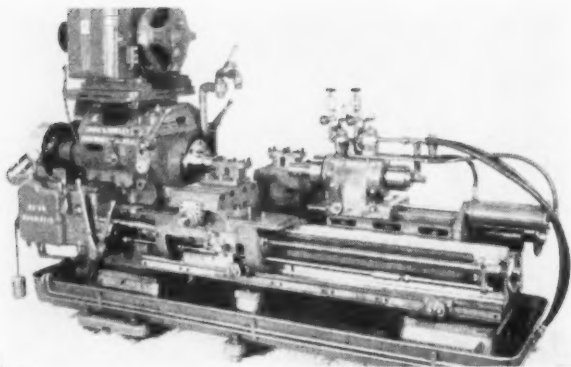


Fig. 9. Air operated chucking equipment showing two sets of air operated mandrels along with rotating cylinders, lubricators and control valves.

On power operated collet type chucks and mandrels, much more gripping force can be exerted, due to the pressure angles.

In the use of either the collet chuck or mandrel, the work piece section should be of sufficient thickness as not to allow excessive distortion.

With the combination of power operated chucking equipment and semi-automatic or automatic cycling of the machine, one operator will be able to take care of two or three machines with less effort than was formerly expended

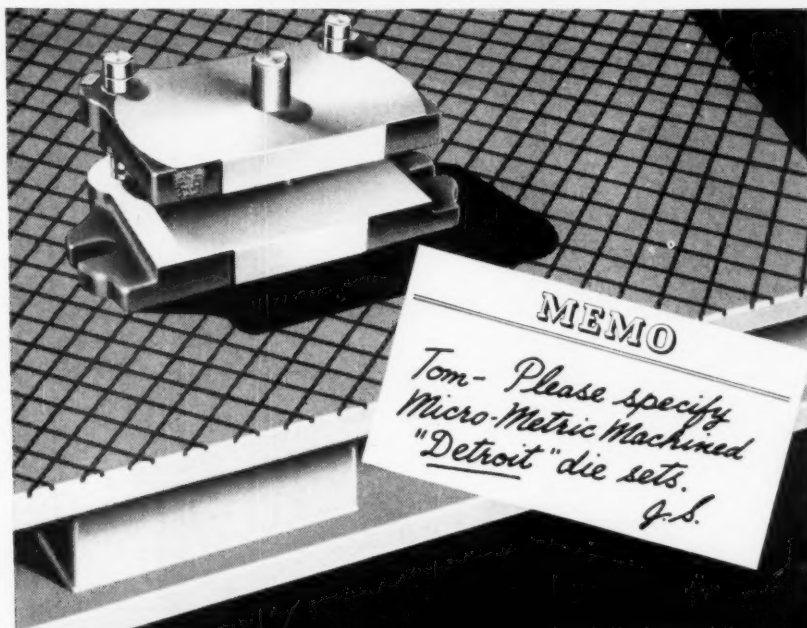
on one manually operated machine.

In specifying either air or hydraulic chucking equipment for large production machining, Tool Engineers and Production Men will find that the expenditure will soon pay for itself in the savings of man hours and in reduction of scrap. **THE END.**

(Photographs are through courtesy of: Seneca Falls Machine Co., No. 1, 2 and 3; Hoefer Mfg. Co., No. 4; Warner & Swasey Co. No. 5, 5A; Monarch Machine Tool Co., No. 6; Sundstrand Machine Tool Co., No. 7; Barnes Drill Co., No. 8; Lodge & Shipley Co., No. 9.)



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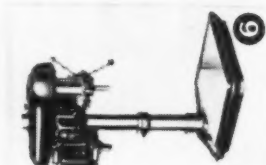
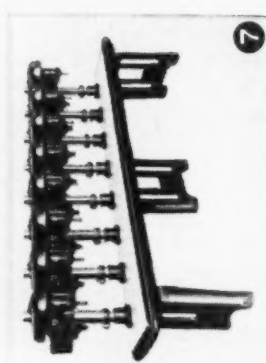
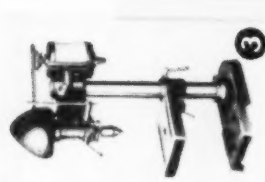
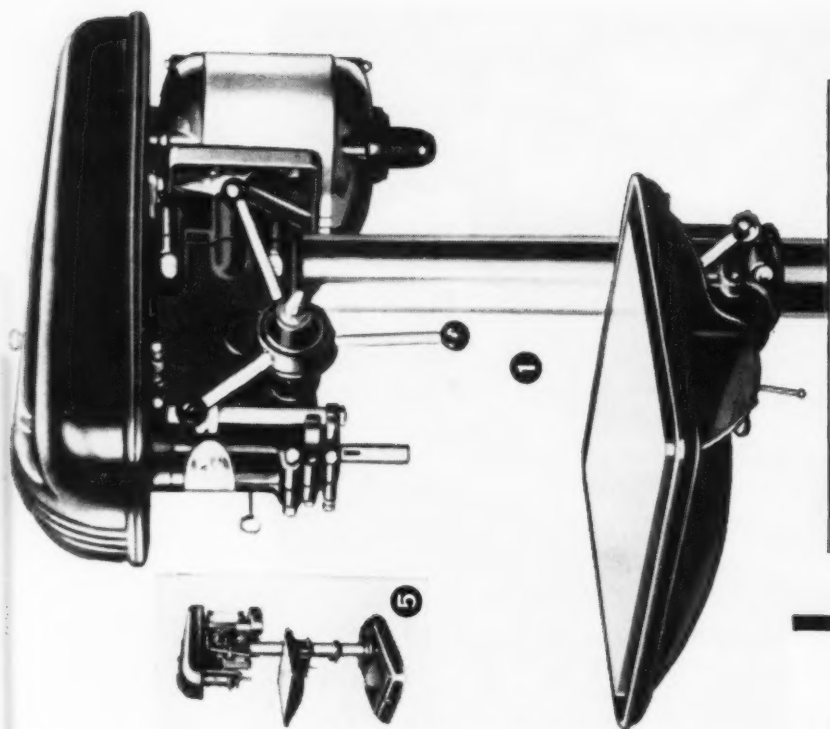
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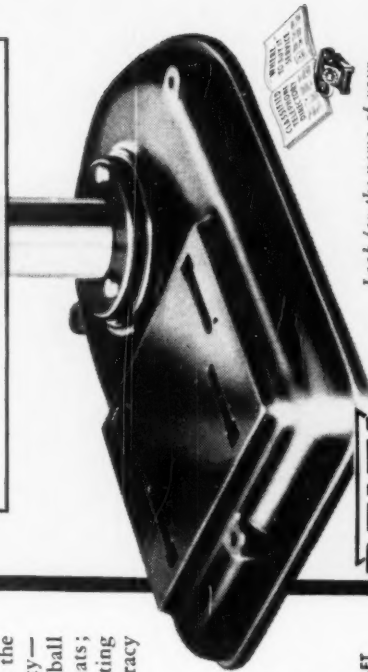
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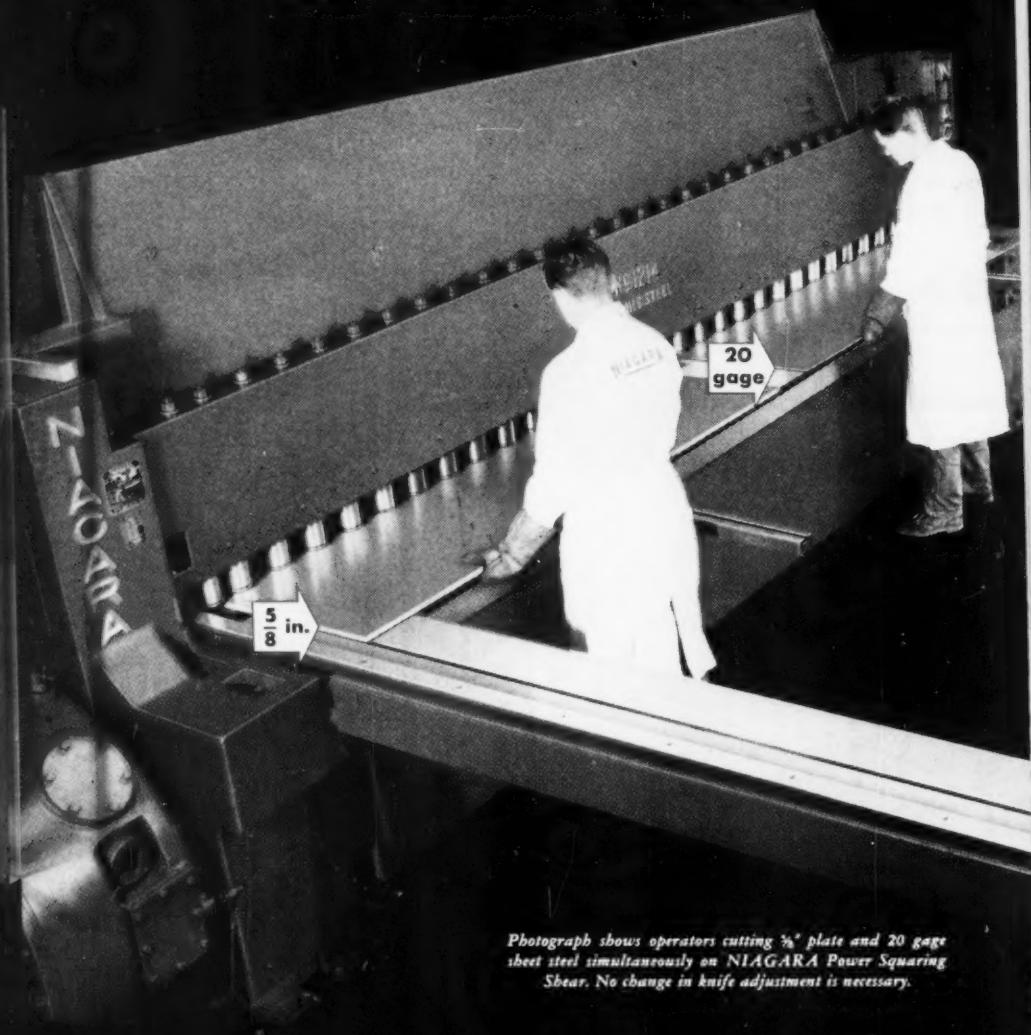
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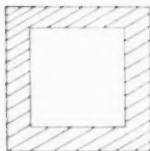
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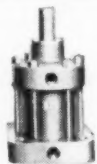
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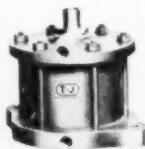
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METHODS OF COST CONTROLS

By Kent Worthmore, C. P. A.

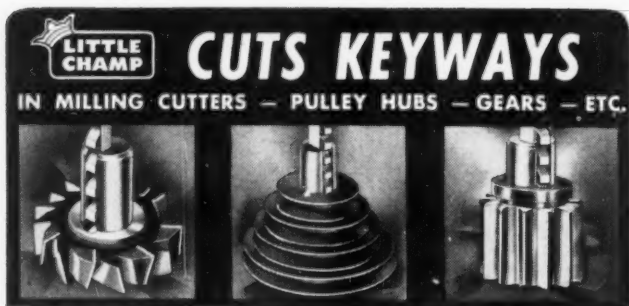
The accurate control of costs is essential in every shop, large or small. In this article the author discusses some of the various systems which can be employed to regulate and control costs. Interesting to note is the emphasis Mr. Worthmore places on the cooperation of foremen in gaining workers' help and their willingness to cut costs wherever possible.

AN ADEQUATE cost system provides for the accounting of all money spent. One that does not do so is dangerous and can easily lead management into ruinous trouble. In any cost system, the basic elements are the same: direct labor, direct materials, and administrative expense or overhead. Direct labor is that which is required to machine and finish an article, and includes in most cases inspection, packaging and other jobs if the time consumed or quantity handled can be conveniently broken down with reference to the units produced. Otherwise such items are carried as overhead. Direct material is that which is required in the manufacture of the article itself.

Administrative expense or overhead includes all other outlay and is commonly classified by groups:

1. **Departmental expense:** Includes the wages of all direct shop workers, cost of supplies, small and perishable tools, repairs to machinery, buildings, power, light, heat, fuel, and when practical in the particular case also includes taxes, depreciations, insurance, and any other items of expense for which each department may be held directly responsible.

2. **General Shop Expense:** This includes the cost of items that cannot be charged specifically to each department, such as the wages of the shop superintendent, stock room help, and others who serve the shop as a whole. Sometimes the cost of drawings, patterns, and tools are included; when not included, they become assets of the business the same as machinery and buildings.



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Saves time because it cuts clean keyways in seconds, not minutes. Simple to use, instructions on lid of each kit.

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3. **Selling expense:** includes the salaries of salesmen and their travel and other expenses, as well as salaries of sales department clerks, advertising, catalogs, and all other expenses incurred for the purpose of selling or of promoting sales of the product.

4. **Administrative expense** includes the salaries of management and all other expenses that cannot be grouped with either the shop or sales department expense accounts; also includes such expenses as telephone, postage, legal fees, donations, and other miscellaneous items incurred in running the business.

plan of distributing it equitably over the units of product being made, which is sometimes difficult.

There are three outstanding plans by which the cost data are assembled and developed into cost of production: job order costs; process system; and standard cost system.

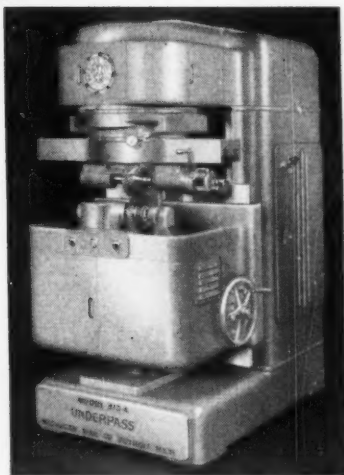
1. **Job order costs:** Under this plan, manufacturing orders are issued for each lot of stock that is to be made up. Direct labor, material required, and frequently expenses of overhead, are totalled and the unit cost obtained.

2. **Process system:** This system can be

Several accounts are usually maintained for the purpose of separating the values of raw material such as castings, steel, lumber and stores. These are inventory accounts and are charged with all purchases and credited as the material is drawn out and used. It is customary to have one account that consists of the charges that accumulate while the product is in process of manufacture. A commonly used title is "Work in Process," and the charges are made from the labor tickets and material requisitions and may or may not include shop or departmental expense and even administrative and other expenses, depending entirely upon the nature of the business and the policies of the management and the extent to which these expenses should be included. If expense is included in the "Work in Process" account, it is necessary to have a

How to cut gear costs AND improve quality

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. . . is so fast and accurate, changeover so easy, tool costs so low.

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used effectively where the unit of output is in tons, gallons, yards, or some other quantitative measure of bulk. The production units are divided into direct labor, direct expense, and materials, and give specific costs per unit of bulk for the various elements.

3. **Standard cost system:** This is perhaps the latest form of cost system and has gained favor in many industries. Cost is calculated and accepted as normal either from past records of cost or by time study and job analysis. Goods produced are debited and credited to book accounts at this cost. Variations either

above or below the actual cost in subsequent production are debited or credited to separate accounts set up for this purpose, and the balance of the account disposed of through Profit and Loss Account. Whenever changed conditions bring about definitely higher or lower normal cost, new standard costs are established.

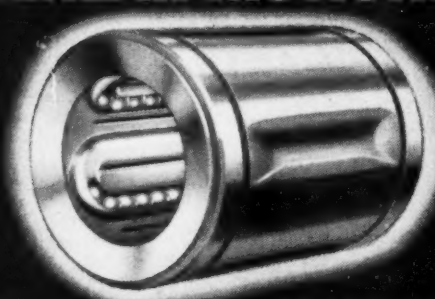
We have mentioned here only the simple elements and primary methods in common use. There are sufficient textbooks available for reference to the refinements and details of each system. The object here has been to bring to the attention of foremen and supervisors these ideas in such a way as to create a greater appreciation of the importance of costs to industrial management and of the necessity for wholehearted effort to obtain accurate cost data for management. Every foreman should keep in

mind that, in the final analysis, the accessibility and accuracy of cost records made in production departments are the most vital part of cost finding.

Shortly before the end of the recent war the general manager of a mid-west plant called a meeting of all supervisors to tell them something about company plans. "We will be increasing production of our regular line at a rapid rate from now on," he told his men. "A number of other companies in our industry are in the same position, and they are getting very busy. Some of the others who did not get into war work very

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LASTING ALIGNMENT • LOW MAINTENANCE • LONG LIFE**

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PROGRESSIVE MANUFACTURERS USE BALL BUSHINGS - A MAJOR IMPROVEMENT AT A MINOR COST

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Now in production for ½",
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diameters. If you have a
sensitive, please your repre-
sentative or write us for new
complete literature and the
name of our representative in
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problem in your own department."

After hearing the general manager's remarks, Bill Thompson, small parts assembly foreman, decided that if he was going to get cost results in his department he would have to get them through his men. He planned his work so that each day he could spend half an hour or so having very personal chats with individual workers. He would tell them what the general manager had told the foremen. He would give them all the background he could as to the company's competitive position. He told them what he could about company plans for the future. He reminded the worker that the future of the jobs of every one in the concern depended upon whether the company's product could be made to sell in competition on the market.

Then Bill went on to point out all the ways in which the individual

strong have been picking up our old customers right and left. It means that we are going to have to tighten our belts and fight for every bit of business we can get."

"This means that we must depend on you fellows to do a close cost control job in your own departments. You are the part of management located right at the point where the actual work is being done. I'm not going to tell each one of you how to trim costs in your department. I've told you how important it is, and I'm going to be very much interested in watching how each of you tackles the

worker stood to gain by holding costs down. He talked over the worker's job in some detail, discussed the condition of his tools and equipment, the materials he was using, any difficulties he was encountering, and got the worker to tell him what he thought he could do to keep costs down on his own job. He made it clear that he was not trying to eliminate jobs by improving efficiency, but trying to protect the jobs of all by keeping costs in line. These personal interviews revealed a great many things. Bill got some excellent suggestions. He found out that not only did the men re-

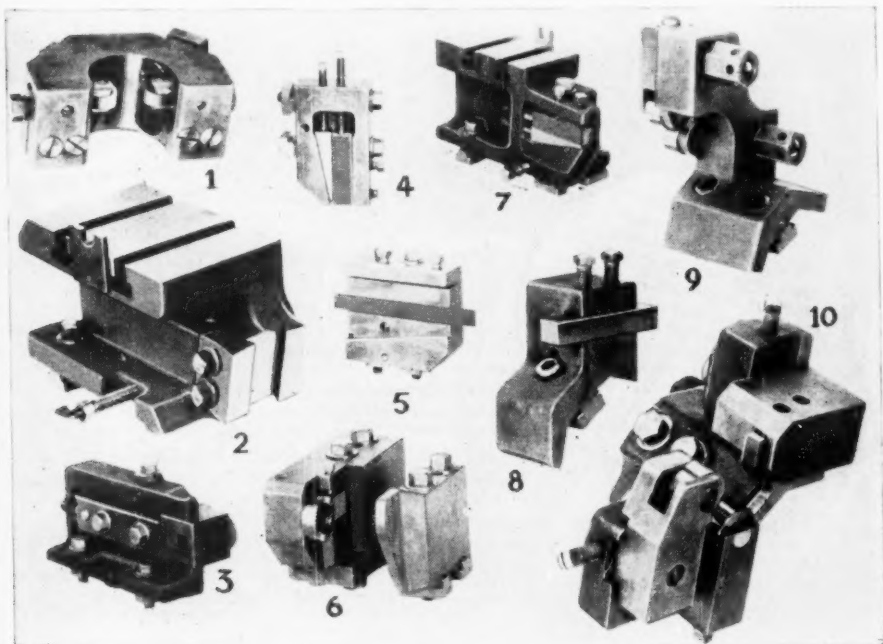
spond favorably, but that many were already cost conscious. Over a period of about three weeks he carried on these interviews and covered every man in the department. He was gratified to find that his men could be interested in costs when the subject was put up to them in such a direct man to man way. The time

to start cutting costs is now. It cannot be done overnight. It is no easy matter. Regardless of system, the human element deserves careful consideration, and only by the cooperation and intensive effort of every individual can any cost system really bring about substantial results in terms of profits.

NAME THE MACHINE PART

Here are ten parts that should be familiar to men in the machine and tool industry. Count ten for each correctly identified part. Above 90 is excellent; 80 is good; 70 is fair; 60 or below places you in personnel.

By Professor Herman Reichardt



- _____ Cut off tool holder
- _____ Circular form tool holder
- _____ Knew turner
- _____ Roller rest
- _____ Double decker vertical or dovetail tool holder
- _____ Flat form tool holder
- _____ Double knurling tool holder
- _____ Block type tool holder
- _____ Roller rest turner
- _____ Double decker cut off tool holder

ANSWERS TO QUIZ ON PAGE 172

*Substitute 1 Machine
for 3 or 4!*

RAISE PRODUCTION and LOWER COSTS

BY COMBINING OPERATIONS with

the **MOTCH & MERRYWEATHER**

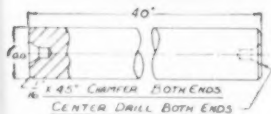
"DE"
(Double End)
**TRANSFER
MACHINE**

1 SAWS
STOCK TO
ACCURATE LENGTHS

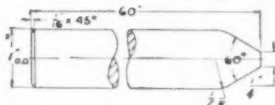
- 2**
- (1) Chamfers both ends.
 - (2) Center drills both ends.
 - (3) Center drills and chamfers both ends. (4) Threads both ends (to a reasonable length).
 - (5) Trepanns one or both ends.
 - (6) Turns one or both ends and I. D.
 - (7) Chamfers O.D. and I. D. tool.
 - (8) Reams one end or both ends of tubing.
 - (9) Chamfers O.D. and reams both ends of tubing.

MORE THAN A NEW MACHINE—ACTUALLY A NEW METHOD

The Motch & Merryweather "DE" (double end) Transfer Machine has no equivalent. Standard bar stock is automatically fed, cut off with a square milled finish to accurate lengths, and automatically transferred to equalizing, self-centering jaws for accurate double-end machining. You save at least one operator; save several handlings; save overhead and floor space; save tooling. Husky construction makes for trouble-free service and long, profitable life. Illustrated below are six typical "transfer" jobs.



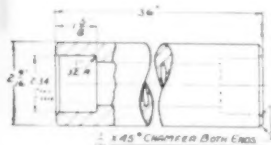
Operation: Cut off, chamfer and center drill both ends.
Material: SAE 1040 ground shafting.
Production: 240 pcs/hr.



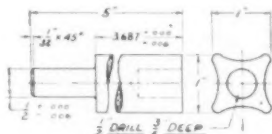
Operation: Cut off, chamfer one end, point opposite end.
Material: D SAE 1141 C. R.
Production: 163 pcs/hr.



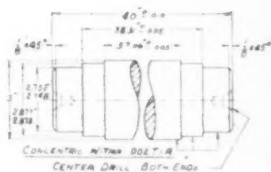
Operation: Cut off and chamfer both ends.
Material: 1020 seamless tubing.
Production: 342 pcs/hr.



Operation: Cut off, bore and chamfer inside and outside, both ends.
Material: SAE 1020 tubing.
Production: 180 pcs/hr.



Operation: Cut off, turn one end, drill opposite end.
Material: Extruded brass.
Production: 200 pcs/hr.



Operation: Cut off, box mill, turn and center drill both ends.
Material: SAE 1020.
Production: 140 pcs/hr.

THE MOTCH & MERRYWEATHER MACHINERY CO.
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AT YOUR COMMAND • AN UNPARALLELED EXPERIENCE IN CIRCULAR SAWING

Letter from England



Written for the **MACHINE** and **TOOL BLUE BOOK** by Robert Hutcheson, Editor of **MACHINE SHOP MAGAZINE**, London, England.



A new atomic energy centre is to be built at Capenhurst in the north west of England and will, in fact, be an extension of a small establishment that is already there. About 150 acres of extra land are to be taken for the project. The Ministry of Supply say that this site, although it means the absorption of agricultural land, was found to be the most suitable for the purpose. Building commences next year and will absorb several thousands of work people from the Merseyside area. The centre upon completion will require several thousand workers.

* * * *

Here in London, not very far from this office, work is proceeding rapidly on the transformation of the south bank of the River Thames where buildings are to be erected for the Festival of Britain in 1951. Behind this Festival is the idea of showing the world all that is best of British products. The exhibition side of the Festival will not be a trade fair or exhibition in the accepted sense. It will be more like the "Britain Can Make It Exhibition" held a few years ago to serve as a shop window for high grade British products. A very wide range of products will be shown and they will be selected as the best in their class and the organisers say that the potential buyer from overseas will be able to see all that he requires without need for journeying from one trade fair to another.

* * * *

The new television station at Birming-

ham, which is situated approximately in the middle of England, will be open in a few days' time. It is an automatic radio link constructed by the British General Electric Company, Ltd., for the Post Office and pictures received 160 miles away from the transmitter at Alexandra Palace in London were as good as those normally seen in London. This link is purely automatic and the television signal is relayed from mast to mast of a chain of six stations. In the event of failure at any one of these stations, duplicate equipment is switched in automatically.

* * * *

The fate of the steel industry is still hanging in the balance and it will depend upon what happens at the General Election which will be held early next year. If the Socialist Party is returned, no doubt one of their first moves will be nationalisation of this vital industry.

* * * *

Longer hours. Appeals have been made by Government representatives for the working of longer hours and especially for the working of a five-and-a-half day week instead of the present five day week that prevails in so many industries. This appeal has not fallen entirely on deaf ears; in a good many branches of the engineering industry longer hours are being worked in firms dotted about the country. However, the idea of returning to a five-and-a-half day week is not popular and some workers have expressed the opinion that if the working week is to be lengthened they would pre-



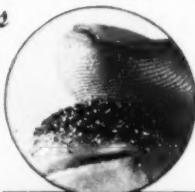
UNRETACHED
PHOTO

NO MORE PAINFUL SLIVERS

LIKE THESE

*... instead, harmless
granular chips*

LIKE THESE



UNRETACHED
PHOTO

**with the PRATT & WHITNEY
KELLER CARBIDE**



TRADE MARK

"Diamond" center-fluting, master ground by machine, produces the correctly staggered, sharp cutting points — an exclusive Keller Carbide DI-BUR feature — to make harmless, granular chips from die steels. Grinding from the shank end keeps DI-BURS true-running ... center-flutes deepened at specified intervals makes nose-cutting easier, smoother. These P&W features account for DI-BUR's superb finishes and productivity on hardened dies and molds. P&W BUR Bulletin tells complete DI-BUR story; write for it.



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**KELLER
Carbide DI-BURS**

fer a slightly longer working day and a five day week. The economics of the five-and-a-half day week are not clear as in some instances the extra time is to be rated as overtime and paid for at the higher overtime rates, which would seem to do little towards reducing cost of output even though output is increased.

Wages remain a bone of contention. The Government wants them frozen with, perhaps, the exception of the lowest paid workers who could probably do with some more money in order to live with the barest possible comfort. This does

not please the craft unions who maintain that there should be a substantial difference between the wages of the unskilled and skilled workers. If there is not this difference, what incentive is there for a boy to follow a poorly paid apprenticeship if at the end of it he gets no reward for his sacrifice? Therefore, in spite of the Government's wishes and the support given to them by the Trades Union Congress, to which most of the unions are affiliated, engineering unions are pressing for more money. The Confederation of Shipbuilding and Engineering Unions, covering a group of unions with a membership of about 2,000,000 men, are demanding an increase of £1. per week.

High taxation and the heavy deduction that is made each week for national insurance make the real earnings of the worker seem low. The amount that he has to spend, compared with the amount that the employer pays in wages, leads the worker to think that his wages are lower than they actually are. Lord McGowan, Chairman of Imperial Chemical Industries, calls for a system of incentives and sanctions which will encourage the industrial worker while penalising the work-shy. He said that industry should refuse all wage demands and that it could no longer afford to employ the work-shy, the habitual absentee and the incompetent. Lord McGowan said that while steps must be



POP'S School of Filing



THE uses of the new Nicholson Machinist's General Purpose File can be carried too far—as portrayed in the scene by "Pop" the shop foreman and "Greasy Pants" the shop dimwit.

The G.P. isn't even intended to supplant regular or special purpose files designed to do some single type of job in the best manner or shortest time. But to the mechanic working variously on aluminum, brass, cast and malleable irons,

mild or annealed tool steels, its ranginess makes it a work speeder on hundreds of fabricating and machine-shop jobs.

The Machinist's G.P. embodies the principles of the Mill (single-cut) and the Flat (double-cut) files . . . combines them to give both *fast metal removal* and *smooth finish*.

See your industrial distributor. Meantime, write us for TECHNICAL BULLETIN, "10 SPECIAL FILE TYPES." Gives further facts about the G.P. Also write for—

FREE BOOK, "FILE PHILOSOPHY" (48 pages), on kinds, use and care of files. Foremen and key mechanics need it. How many copies?



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The unique friction clutch on this new, improved, Procnier high speed tapping head practically "thinks" for the operator . . . making taps last longer, cutting production time and cost. This double-cone clutch engages the drive and reverse shells with a velvety "cushioned" action. Tap driving power is **automatically regulated** by the amount of pressure applied to it. "Blind" tapping is done as easily as through tapping. The operator can quickly detect dull or "loaded" taps just by the pressure needed to drive them. This increased sensitivity and smoothness results in: fewer broken taps; less operator skill needed; faster, lower cost tapping! This improved Procnier tapping head has many more time and money saving features. Write today.

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Gentlemen:

Please send your illustrated brochures which give complete prices and specifications on Procnier High Speed Tapping Heads and Machines.

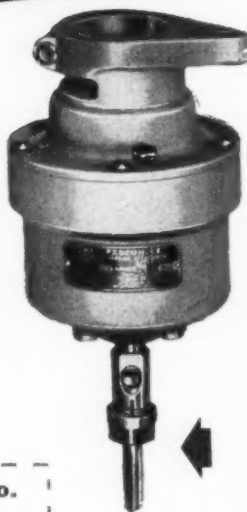
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"TAP SAVER"**

Exclusive "Tru-Grip" tap holder, lighter, smaller in diameter, minimizes "fly-wheel" effect. It affords easier tapping close to walls or shoulders, eliminates "chewed up" tap shanks.

taken to abolish poverty, we must guard against the tendency of regarding wages merely as an income for the wage earner and forgetting that they are a cost to industry. We need a wage structure that instead of guaranteeing a certain standard of living is based on a policy of incentives and sanctions to encourage the industrious and penalise the lazy. So far as working hours are concerned, Lord McGowan says that the solution is not to increase production by working longer hours, but to obtain greater production from existing hours of work by greater effort.

for annual or public holidays. The figure for the month of August in each year is affected by the number of firms taking annual holidays in that month.

Urges visit to America. Mr. Wilson, President of the Board of Trade, who has just returned to this country after visiting the North American Continent, is urging heads of firms to visit dollar markets to make a first hand investigation of the local requirements that they must meet. The Exports Credits Guarantee Department, however, is refusing to grant cover for visits to New York.

The steel founders belonging to the British Steel Founders' Association have formed a research and development division with the aim of reducing costs and improving quality of British steel castings. Member firms will be provided with the latest information on all manner of production problems.

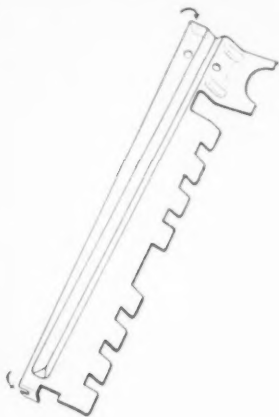
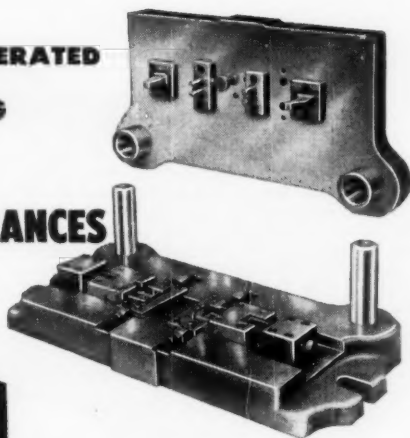
An interim index of industrial production for September 1949 has just been issued by the Treasury. The index number of industrial production (based on an index of 100 for 1946) has been prepared by the Central Statistical Office and is estimated provisionally at 132 for September 1949 compared with 119 for August. Figures for the corresponding months in 1948 were 124 for September and 110 for August. These figures are adjusted to the number of days (excluding Sundays) in each month but no allowance is made

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The cam-operated die pierces a fussy slot (.063 wide) in one end of various Selector Bails, and pierces a hole (.063) in the other end. (See arrows left.) Tolerances as close as $\pm .001$ are maintained, with 50M to 75M pieces per grind.

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127

It is said that it is useless for the British manufacturer to visit New York and make contacts there and to return with the feeling that he has opened up himself to the American markets.

More steel for auto makers. Mr. L. P. Lord, Managing Director of the Austin Motor Company, welcomed the increase in steel allocation promised to the motor industry, and we wonder, judging from his remarks, whether he is in common with many other people in thinking that there appears to be confusion of thought among some of the planners. He comments on the fact that the steel had to come from America and that cars made

from it are to be sold in the dollar area. At the same time, says Mr. Lord, British steel is being supplied to French automobile works in order that the French automobile industry can compete with the British in dollar areas. He mentioned that out of the last week's output of cars from his works, only one vehicle has been allocated to the British market, the remainder being allocated to export. Mr. Lord also commented on the Company's employees, saying that before the war the Company made 1,700 vehicles a week, whereas production now averages 3,011 a week with about the same number of employees as in pre-war days.

WHAT DO YOU KNOW ABOUT CUTTERS?

By Professor Herman Reichardt

Here are six questions on cutting tools and their care. Count ten points for each correct answer to questions 1 through 5. In question 6 count five points for each part of the cutting tool that you properly identify. If you get a total score above 90, you know cutting tools; above 80 is still good; 70-80 is respectable; below 70, you are slipping.

1. The sharpening of cemented carbide tools requires a grinding wheel of finer grit than the sharpening of high speed steels.

True: False.

2. Nonferrous cast alloy cutting tools will retain their edge-strength and hardness at a red heat.

True: False.

3. The clearance for a conventional dovetail tool is:

0-5 degrees; 5-10 degrees; 10-15 degrees; 15-20 degrees

4. Cutting speeds for nonferrous cast alloy tools are higher than cemented carbide tools.

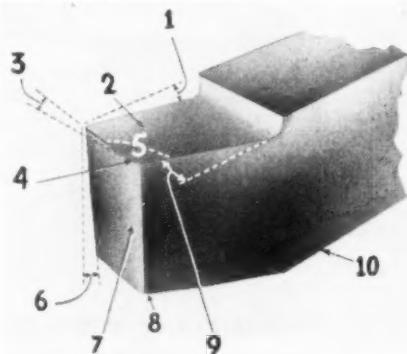
True: False.

5. Wheels used in sharpening high speed tools should be harder than those used for sharpening nonferrous cast alloy tools.

True: False.

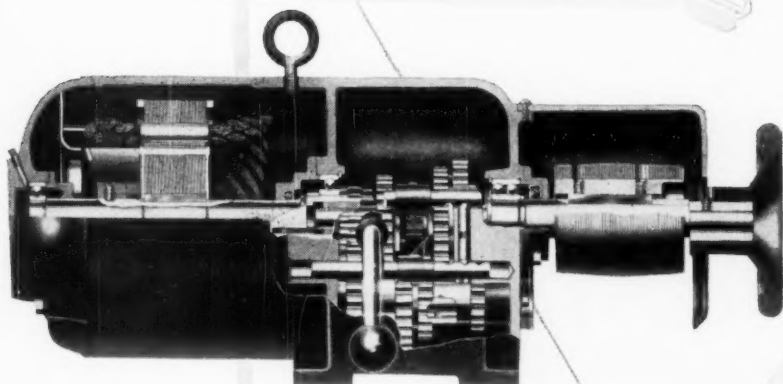
6. Identify the parts of this cutting tool by placing the number opposite the parts listed below.

- _____ Base
- _____ Flank
- _____ Face
- _____ Nose
- _____ Heel
- _____ Clearance angle
- _____ End Cutting angle
- _____ Back rake angle
- _____ Side Cutting angle
- _____ Cutting edge

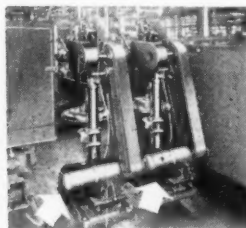


ANSWERS TO QUIZ ON PAGE 239

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Today's high speed production schedules demand greater machine flexibility than ever before. LIMA GEARSHIFT DRIVES, originally employed to modernize older types of machine tools, are now, through improved design meeting wide acceptance by new machinery manufacturers. Built with four or eight speeds, LIMA GEARSHIFT DRIVES are available in ratings from $\frac{1}{4}$ to 25 hp, and can be furnished with or without integrally mounted motor, as required. If you have a drive problem, write us. Our Engineering facilities are at your disposal. Bulletins and application photos available at your request.



Typical application—courtesy International Harvester Co.

LIMA

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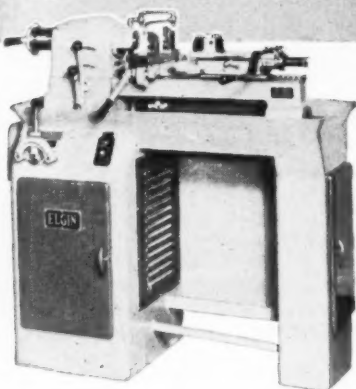


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Elgin Vertical Bench Drilling Machine

Preloaded ball bearing spindle. 9/16" collet capacity. Five speeds ranging from 400 to 4000 rpm. Vertical travel of spindle, 1 3/4". Table 4 1/8" x 18". 90° swivel each side of center line.

If your production problems depend on the speed with which small parts are machined, an ELGIN may be your answer. The line of ELGIN High Speed Precision Bench Tools is designed to pay you dividends in better machining results, faster production and greater versatility. Write for specifications, prices.



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THE ECONOMIC OUTLOOK FOR 1950

Perhaps a few wrong guesses in the last several years have caused some people to think poorly of estimates and surveys. We agree they are opinions and not facts, likely to change with any wind. However, reliably conducted surveys of business conditions by experienced organizations will pierce future's black curtain and throw some light on what may lie ahead. Therefore, we are presenting this analysis from the F. W. Dodge Corporation.

—Editor.

WHAT IS THIS country's economic outlook for 1950? This over-all question, broken into its primary components, was recently put before a panel of 108 leading economists by F. W. Dodge Corporation—56 of them connected with private business and financial institutions, 52 of them with colleges and universities. This opinion survey was made in the early part of October, in the form of a comprehensive mail questionnaire.

The principal conclusion to be drawn from the tabulated answers is that further readjustment will characterize the American economy between now and the middle of 1950, with a moderate rise to follow during the latter part of next year.

Some respondents made distinct reservations as to the contingency of extended duration of coal and steel strikes. These reservations should be particularly borne in mind in interpreting the answers to questions 1, 2, and 3.

The particular ingredients making up this basic conclusion are the following: insignificant change in the physical volume of production, approximately stable civilian employment, moderate downward movements in the wholesale commodity price index and in the cost-of-living index, stability of wage scales in industry combined with increasing benefits equivalent to wage increases, and a moderate decline in total consumption expenditure.

A majority of the economists anticipate a decline from 1949 in the number of dwelling units to be built in 1950, and a decrease in private non-residential

building. These building declines will be counterbalanced to a degree by an increased dollar volume of public building and engineering work.

QUESTIONS AND ANALYSIS

1. Readjustment has characterized business activity generally during the past 12 months or so. What do you see ahead? Further readjustment for the remainder of 1949 (50%), though a substantial number (41.66%) expect a moderate rise. A majority (57.54%) expects that further readjustment will characterize business activity during the first half of 1950, though many (36.79%) expect a moderate rise. A moderate rise is expected by most (50.50%) in the last half of 1950, with a diminishing number (35.35%) expecting further adjustment. We may conclude that further readjustment will characterize American business activity between now and the middle of 1950 with a moderate rise to follow during the latter part of next year.

2. What about the physical volume of production? Opinion as to physical production during the remainder of this year was mixed. The largest number (38.31%) expect a moderate decline, yet almost as many (33.64%) expect a moderate rise, and a substantial number (26.16%) foresee insignificant change. The median opinion ranged from pronounced decline (1.86%) to pronounced rise (0.00%), was insignificant change.

As for the first half of 1950, the largest number (41.12%) expect a moderate decline, while opinion was almost equally divided between those who foresee in-

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being the median opinion in the range from pronounced decline (4.08%) to pronounced rise (4.08%). To sum up, insignificant change is to be expected in physical volume between now and the end of 1950, with a reasonable expectation of moderate declines between now and mid-year 1950, and moderate rise in the last half of 1950.

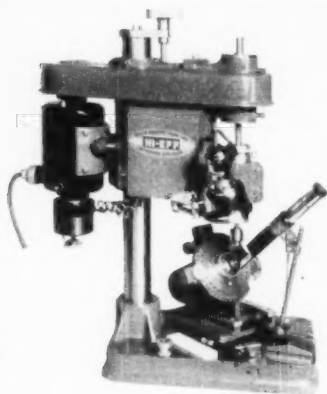
3. What do you expect with respect to total civilian employment? A definite majority (54.20%) expect civilian employment to remain approximately stable during the remainder of this year, while a substantial number (30.84%) expect a downward trend, and fewer still (14.95%) anticipate an upward movement in civilian employment.

significant change (27.10%) and a moderate rise (29.90%). The median opinion, ranged from pronounced decline (1.86%) to pronounced rise (0.00%) was insignificant change.

That a moderate increase in physical production will be made in the last half of next year is expected by a substantial number (43.87%), although grouped together those expecting pronounced decline (4.08%), moderate decline (27.55%) or insignificant change (20.40%) constitute a bare majority, with insignificant change

Some falling off in civilian employment is expected by a substantial number (37.96%) in the first half of next year, although more expect employment to remain approximately stable (45.37%) and fewer (16.66%) anticipate an upward trend. The preponderant opinion is that civilian employment will remain approximately stable in the first half of 1950.

A shift toward expectation of upward civilian employment (36.36%) in the last half of next year, as compared with the remainder of this year (14.95%) and the



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first half of next (16.66%) is noted, though the progression is counterbalanced by a sizable (35.35%) expectation of downward employment and a substantial (28.28%) expectation that employment will remain approximately stable. In generalizing we may say that civilian employment will remain approximately stable or decline during the remainder of this year and the first half of next, and remain approximately stable in the last half of next year.

4. What is your expectation with regard to wholesale prices? Where do you

think the BLS index—152.4 as of August 30, 1949—will stand on December 31, 1949, on June 30, 1950, on December 31, 1950? The median expectation is an index number of 150 at the end of this year, 148 at the end of next June and 146.5 at the end of next year. A general and moderate downward movement in the wholesale commodity price index is expected between now and the end of next year.

5. Please indicate your opinion as to the wholesale price trend of the following commodity groups during the next fifteen months: farm products, metals and metal products, building materials. During the next 15 months, the majority (81.73%) expect wholesale prices of farm

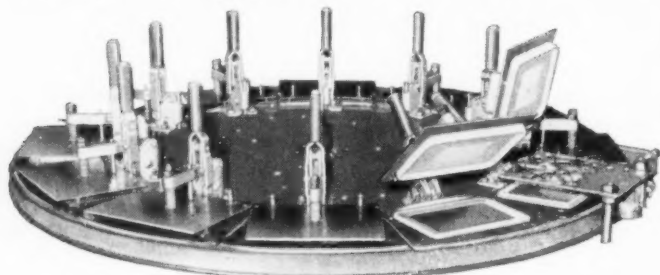
products to be downward, with less than 1% expecting an upward price movement, and a moderate number (17.30%) expecting farm product prices to remain approximately stable.

The expectation with respect to the behavior of the wholesale price index for metals and metal products, and for building is not quite so clear.

The largest number (48.51%) expect wholesale prices of metals and metal products to be downward, but a substantial number (36.63%) anticipate ap-



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proximately stable prices, and some (14.85%) expect an upward price movement.

So far as building materials are concerned, a clear majority (53.92%) expect wholesale prices to move downward, but a large number (46.07%) do not share this view, more than one third (35.29%) expecting an approximately stable price structure and the remainder (10.78%) anticipating an upward movement. Preponderant opinion on this question points to a definite downward movement in the wholesale price of farm

products, a downward trend, but not pronounced, in metals and metal products, and a moderate downward trend in the wholesale prices of building materials as a group.

6. What is your expectation with respect to the BLS cost-of-living index—168.5 as of July 15, 1949—on December 31, 1949, on June 30, 1950, on December 31, 1950? A moderate decline in the cost-of-living index is expected between now and the end of next year, generally paralleling the downward movement expectation reflected in the answers to question 4 on wholesale commodity prices. The index of 168.5 as of July 15 this year is expected on the basis of the medians for each date to stand at

167 on December 31 this year, 165 on June 30 next year, and 163 on December 31, 1950. Generally progressive downward cost-of living index through next year.

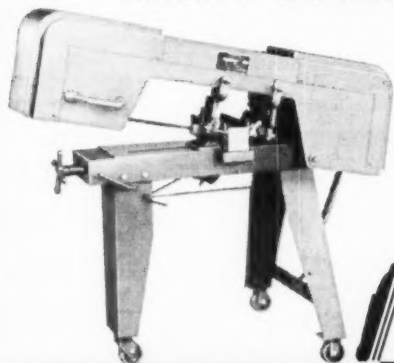
7. What is your expectation as to wages in general industry during the coming year—hourly rates, benefits equivalent to wage increases? The predominating number (81.30%) hold that wages in industry will remain generally stable during the coming year, with compelling opinion (92.59%) that workers will receive benefits equivalent to wage increases. Comparatively few (13.08%) ex-



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pect wages to increase, and fewer still (5.60%) anticipate decreasing wage scales. As to benefits equivalent to wage increases a few (1.85%) expect no increase and a small number (5.55%) expect the picture to remain "generally stable." To conclude, wages in industry will remain generally stable during the coming year, and the opinion is overwhelming that many industrial workers will receive benefits equivalent to wage increases during next year.

decline next year, perhaps in the range of 3 to 5% from the 1949 level.

9. Do you estimate that 1950 residential building volume as measured by new dwelling units will be greater or less than in 1949? A majority (67.96%) expects fewer dwelling units to be built next year than this, with the median based on 90 of 108 answers containing a definite plus or minus figure being 5%, and the average 4%. A sizable number (30.09%) foresee an increase in the number

8. What is your expectation for 1950 with respect to total consumption expenditures? The statistical weight of answers indicates a decline expectation with respect to total consumption expenditures. Less than one fifth (19.62%) expect an increase, with a substantial number (42.99%) anticipating a decrease, and many (37.38%) expecting expenditures to remain about the same in 1950. Further emphasis on the downward trend expectation is found in a tabulation of percentage increases and decreases given in the answers of 41 of the 108 respondents, the median of these indicating a decline of 5%, and the average indicating minus 3%. Generalizing, total consumption expenditures will

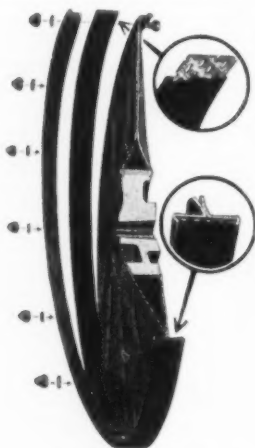
of dwelling units to be built next year. Conclusion is that two thirds of the respondents expect the number of dwelling units to be built next year to be less than this year's volume.

10. Do you estimate that the dollar volume of private nonresidential construction in 1950 will be greater or less than in 1949? Almost three quarters (73.07%) expect a decline in the dollar valuation of private nonresidential construction next year as compared with the volume of 1949, although a large number (25.96%) anticipate an increase. Less than 1% expect little change from this year. A downturn in private nonresidential construction in 1950 is generally predicted.

11. Do you estimate that the dollar volume of public building and engineering volume in 1950 will be greater or less than in 1949? A large majority (85.43%) anticipate that the dollar valuation of public building and engineering volume will continue upward in 1950, a minor number (10.67%) expect a decline, and a few (3.86%) believe volume will be about the same as this year. To sum-

marize, public building and engineering works in 1950 will exceed this year's dollar volume.

12. In your opinion, will the following factors significantly affect American business and construction volume in 1950? Strikes in key industries—will affect unfavorably (53.39%), no pronounced effect (46.60%), will affect favorably (0.00%). National legislation—will affect unfavorably (24.27%), no pronounced effect (61.16%), affect favorably (14.56%). Federal taxing and spending—will affect unfavorably (39.80%), no pronounced effect (28.15%), will affect favorably (32.02%). Congressional election campaigns—will affect unfavorably (24.27%), no pronounced effect (66.99%), will affect favorably (8.73%). Conditions in British Empire and sterling area—will affect unfavorably (65.94%), no pronounced effect (25.25%), will affect favorably (9.70%). Conditions in Continental European countries—will affect unfavorably (47.57%), no pronounced effect (39.80%), affect favorably (12.62%). Conditions in Far East—will affect unfavorably (43.68%), no pro-



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nounced effect (52.42%), will affect favorably (3.88%). Anticipated development in domestic labor, legislation and elections, and anticipated trends abroad are expected in general, to have either unfavorable effect or no pronounced effect on American business next year, with the possible exception of federal taxing and spending where opinion was fairly evenly divided as to favorable, unfavorable or no pronounced effect.

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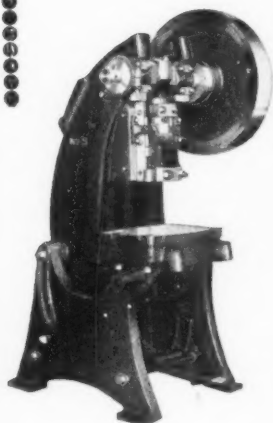
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THE FOREMANSHIP FORUM

By Edmund Mottershead

SHOP DISCIPLINE . . . SIGN OF LEADERSHIP

DISCIPLINE is a strange proposition. Personally, like every other American, I have always resented the implications of subjection and punishment. I think the average foreman and supervisor feels the same way, as well as the typical worker. We, all of us, want to know, first of all, the constructive end towards which any discipline applied to ourselves is being directed.

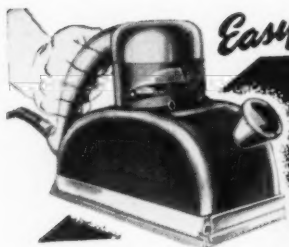
The attitude of modern and progressive management is that the worker be handled with a view toward obtaining the best possible results with the least friction. Firm, but considerate regulation is the rule. No workman need be pampered; however, men should not expect or require coddling. The foreman is doing them a favor if he is firm. At the same time, the foreman must bear in mind the various aspects of labor legislation, avoid "unfair practices," and stay within the areas of acceptable activity in labor relations. Experience shows that the degree to which discipline is maintained bears a direct relationship to both the happiness of the workers and the output of the department.

Much laxness springs from simple beginnings. The foreman wants to be on friendly terms with the workers and becomes overly familiar with them, losing their respect. They indulge in a little horseplay and get away with it. They start visiting during working hours. I know of one case where a manufacturing tailor, employing female seamstresses at machines, has only 3 workers who produce their quota out of 60 workers on the floor, because of excessive visiting. Pretty soon the men start loafing a bit, sneaking a smoke during working hours, and then smoking promiscuously. They commence work late in the mornings and at the beginning of the afternoon. They begin to come in tardy in

the mornings and start work even later. Then they begin cleaning up and closing down their machines before quitting time to be ready to leave on the whistle instead of quitting on the whistle. Then somebody starts to eat lunch during working time. There gets to be a general laxity in the matter of shop housekeeping followed by increasing failure to observe simple safety rules, failure to use safety equipment. Somebody gets hurt, and they blame it on the foreman for his laxity in not seeing to it that the proper safety device was used. Then there is some more horseplay and outright failure to obey orders. More dissatisfaction and irritation brings on willful waste of materials, breakage of tools, the slow-down. We all know the picture.

And the cause of it all was the foreman . . . his inability to deal with the men properly in the first place. But you don't have to mount guard over the men, either . . . as this gains you nothing but dislike and opposition. Their likes and dislikes, their motives and ideals, their natural inclinations can all be turned to useful account. Discipline should not be **enforced**, but **induced**.

The problem of "reasoning" with the worker is often complicated by outside factors, the presence of other workers or supervisors, labor market conditions, and what not. One foreman related to me an experience of his: The plant superintendent visited his department the second day he had been transferred to it as foreman. While walking through with him, the foreman noticed that the coolant was not flowing properly through a machine. To find out if the pump was down, or if the supply of oil was too low, they both reached into the oil reservoir and found that the pump was broken. When they straightened up, the foreman said to the worker, "Hand me your towel, will you, Bud, so we can



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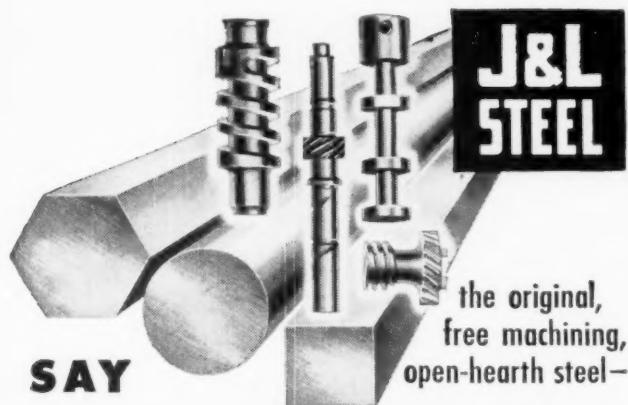
wipe our hands." The worker replied, "Who are you calling 'Bud'? That isn't my name. I don't like to be called Bud. And if you want to make something of it, I'll knock your teeth down your throat."

The superintendent and the rest of the gang were taking the whole thing in. The foreman had only been there a day and a half. The former supervisor had pointed out this man as the best operator in the place. The labor market was tight, and the new foreman didn't know the names of his men yet. A nice pickle. So the foreman picked up a towel him-

self and simply told the operator he would talk to him later on. After the superintendent left he talked with the man, who told him that for personal reasons he didn't like to be called Bud, and thought the foreman should at least know the names of the best operators. The foreman said that was reasonable, that the operator could possibly have gone at things a little differently, let's get acquainted, and so on. After about a week the two men were getting along very well.

Another foreman relates the story of a machine tender who was finally fired. Jack was a machine tender in this paper mill, a good worker, about 20 years old and single. He had been there about a year and a half. One unusually hot summer night he left his machine several times to go out in the yard for a smoke. On several of these absences the machine broke down. Each time,

the foreman went out after him, told him to come back, and stay on the job. Finally he told Jack that if he had to come out after him again he would be looking for another job. Jack left his machine about an hour later. The machine broke down. Jack was fired. Three days later the employment manager called the foreman and asked him if there was anything against Jack, and if he would object to Jack's being hired for another department. Since men were scarce, the foreman said he thought it would be all right, and Jack has been producing regularly and well behaved



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ever since. Maybe the jolt was all Jack needed.

The old fashioned supervisor was an autocrat who superimposed his commands on the wills of his workers. His employees' wants were ignored as unimportant. But these methods no longer bring results, and actually bring on more trouble and waste. The modern definition of discipline is "that kind of training and control which makes punishment unnecessary" . . . control by appealing to the desires of the employee.

Everett R. Conover says that the various manifestations of a lack of disci-

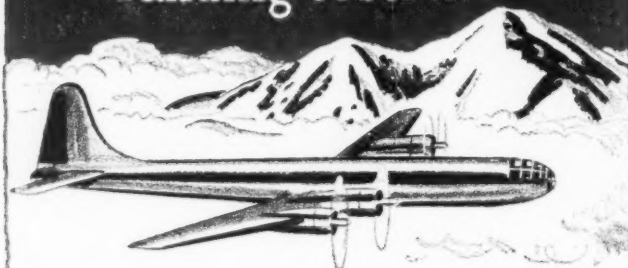
pline, including tardiness, horse-play, errors, complaining, trouble making, and the rest, are traceable to definite causes. Among the causes he enumerates lack of ability, lack of understanding, willful disregard of orders, standards too low, not enough work to do to keep busy, loss of face, poor training, lack of job pride, bad home conditions, desire to satisfy ego, lack of respect for employer, personal difficulties, belief that treatment accorded him has been unfair.

Mr. Grover has developed a three-step formula for correcting workers and maintaining discipline, which is well worth every foreman's remembering: The three steps are—1. Counsel, 2. Caution, 3. Show Down.

1. COUNSEL:

On the man's first "offense," take it easy. Begin if you can with praise of previous good performance or good intentions of the worker. Get him to admit his

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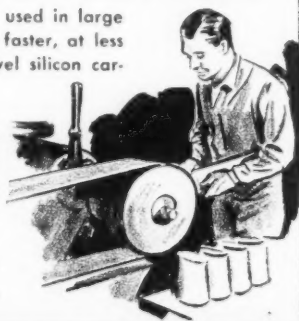


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with others. Encourage the employee for effort; show him how his interests are served best by conforming to the shop rules and regulations. Be certain to convince the worker that you are really trying to HELP him and that your whole attitude is one of helpfulness rather than suspicion.

2. CAUTION:

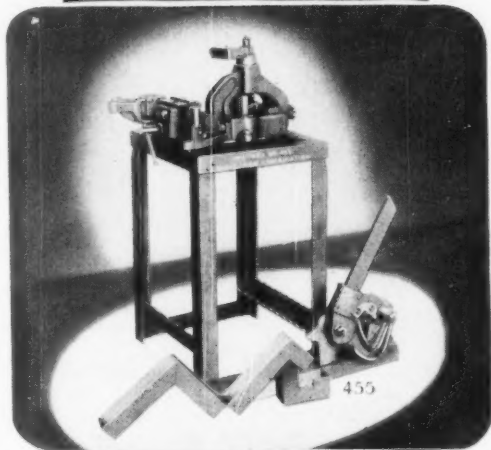
Even on second "offense," get the facts . . . get all the facts before making a decision. Get the worker to talk and open up on the matter. While you're at it, be sure to control your own temper. Praise any slightest improvement

if you have a chance. Where possible, call attention to mistakes indirectly, so that the worker has a chance to realize his error without losing face. Sometimes it pays to talk about your own mistakes first; possibly you haven't explained something to the worker, perhaps he'd like you to show him how to do it. Don't nag. Give him every opportunity to save his face. Let the employee sense that you believe in his honesty, in his good intentions, in his interest in the work, in his ability and reliability, in his willingness to settle any question fairly. Give "the dog a good name." Avoid anything which will make him feel inferior or give him the sense that you are belittling him.

3. SHOW-DOWN:

"The show-down" is an old poker term. It is the end; this is it, or else. However, in maintaining good labor relations, that attitude on the part of the supervisor is not usually successful. True, there are times when the worker either will do so and so, or else; but before taking such extreme measures, investigate again and be sure you have the facts right and that the disciplinary action is really merited. Follow the practice of opening such an interview with a question about the circumstances. Avoid jumping on the employee before you have double-checked the facts . . . with the worker. Give the person being reprimanded plenty of opportunity to talk and justify himself. You can't correct him until you know why he did the

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truth of the matter . . . on FACTS and not just circumstantial evidence.

The need in maintaining good discipline is for thorough training and orientation of the workers, for a positive, progressive, and friendly attitude among supervisors. As an aid to checking up on yourself, on the following page you will find a check-up chart of the workers in your department. Just answer "Yes" or "No" whether or not you have such workers in your department. Then look at the second part of the checklist for possible interpretations of your answers.

In connection with using orientation technique to establish and maintain discipline, it is sometimes found to be sound practice to have in an employee booklet printed rules and regulations covering the various aspects of personal conduct in the shop. If all employees thoroughly

understand these rules, and if the rules are firmly but kindly enforced by supervisory workers at the lower levels, a great deal of trouble can be avoided. A good sample of such a statement of rules and regulations is to be found in Appendix I which contains sections of one firm's organization manual.

Another element in maintaining discipline is the possibility of employee self-government organizations. Where "industrial democracy" is really effective, there is usually so little disciplinary action required that discipline as such is not a problem. Where the workers have a

wrong thing. Give him a chance to tell you. Be a good listener. Remember, the real cause is very likely deeply hidden, and your own methods of supervision may be a contributing cause.

Whatever else you do, criticize the man in private. Keep in mind that the purpose of your interview and of any disciplinary action is to get better results currently and in the future . . . not to hurt anyone or to relieve your own excited feelings or temper. Convince the worker that when you take action, you do so on the basis of facts and evidence which he admits to be the

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sufficient stake in the success of the enterprise and also have an opportunity to make effective expressions of their desires and knowledge in the conduct of the industrial enterprise, the problem becomes one of channeling their ideas and suggestions into the most effective means of action rather than straining to get their cooperation. Prompting self discipline among the workers does not mean that the supervisor may sit back; his task is that of leadership. Fundamentally, good discipline today is a mat-

ter of constant training and continuous education and orientation of both employees and supervisors.

IN BRIEF:

1. Progressive management wants leadership, not punishment; a positive attitude.
2. The three step method for disciplinary action:
 - a. Counsel
 - b. Caution
 - c. Show-down.

PART ONE: If you recognize among the following any workers who are at present working in your department, check "YES" below.

- | | | | |
|---------------------------------|-------|-----------------------------|-------|
| 1. The "miscal" worker | _____ | 11. The critical worker | _____ |
| 2. Chronic ailing worker | _____ | 12. Chronic complainer | _____ |
| 3. Resents criticism | _____ | 13. Lazy ... clock watcher | _____ |
| 4. Jealous employee | _____ | 14. Stubborn, uncooperative | _____ |
| 5. Insubordinate worker | _____ | 15. Irresponsible worker | _____ |
| 6. Thoughtless employee | _____ | 16. Shy, retiring worker | _____ |
| 7. Conceited, "superior" worker | _____ | 17. Slow, dull, stupid man | _____ |
| 8. Indifferent, disinterested | _____ | 18. Careless worker | _____ |
| 9. Temperamental employee | _____ | 19. Irritable, nervous | _____ |
| 10. Worker with a "pull" | _____ | 20. Worrier, home troubles | _____ |

PART TWO: DIAGNOSIS —

1. If you have answered YES to numbers 1, 3, 17, or 20, there is a possibility that you need to do a little thinking about whether or not you have made a thorough enough study of the job and the man to see whether they really fit. Do you really know the worker?
2. If you have answered YES to numbers 2, 9, 12, 18, or 19, there is a real possibility that hidden personal factors are at work in the worker of which you have no knowledge. Have you done everything to make the worker feel that his job is important? Have you done everything possible to provide good working conditions? Are you sure that these men know you really want to HELP them, not coerce them?
3. If you have answered YES to numbers 4, 7, 10, 11, 14, or 16, there is a chance that you have not taken time to learn the real motives of your men. Have you consistently "given the dog a good name," or have you ignored human nature and tried to drive your men?
4. If you have answered YES to numbers 5, 7, or 14, it is entirely possible that your method of supervision needs checking over. Have these men really been trained and oriented properly?
5. If you answered YES to numbers 6, 8, 13, or 15, there is clear indication that you have fallen down on your training job, on your task of motivating your men. Think it over.

Announcement has been made by **Cone-Drive Gears (Division of Michigan Tool Co.)**, Detroit, of the purchase of the 12th Street, Traverse City, Mich., plant of Parsons Corporation. The plant, contains approximately 40,000 square feet and was built during the war.

Cone-Drive Gears officials state that alterations to the plant will be under-

taken in the near future. It is hoped that manufacturing operations can begin early in 1950. About 100 men will be employed by the new industry.

Cone-Drive Gears manufactures a special type of gear called "Cone-Drive" and also produces speed reducers using this type of gear.

POWER
TOUGHNESS

PROTECTION
BALANCE

LONG LIFE
DURABILITY

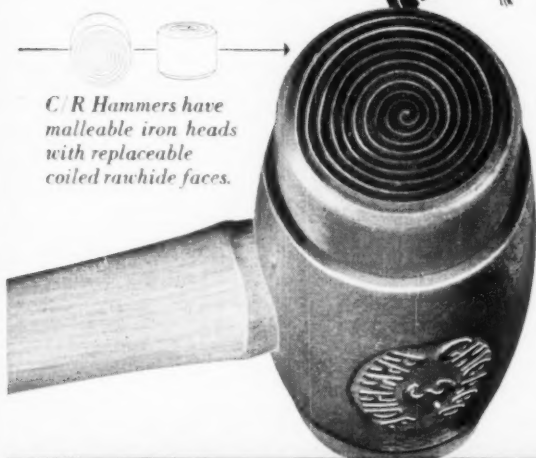


RAWHIDE

... that's the material which gives you *everything* you want in top grade "soft" hammers and mallets. And *Chicago* means the best in Rawhide. C/R mallets and hammers are made from resilient, tightly coiled rawhide. They absorb shock, deliver powerful blows yet protect delicate machinery and surfaces, and stand up under continuous hard use. They do not split, crumble, or mushroom. For durability, power and safety, always specify *Chicago Rawhide*.



C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.



CHICAGO Rawhide MFG.CO.

1321 ELSTON AVENUE

CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat and twist belting; belt pins and belt lacings; gears, pinions and gear blanks; aprons and hand leathers; hydraulic packings.

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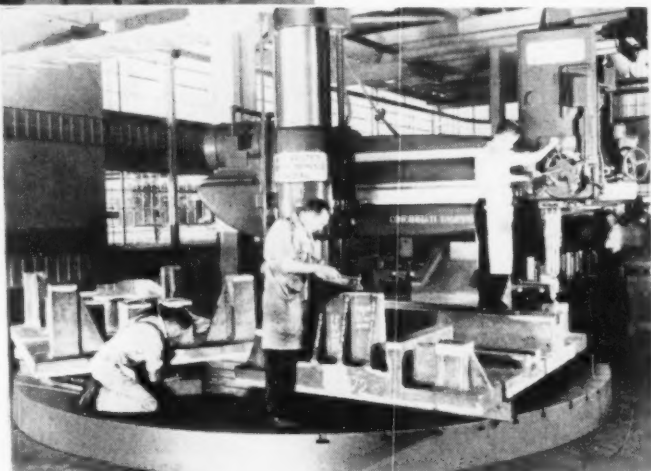
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VIEWS . . . *from here and there . . .*



L. S. Starrett Co. officers inspecting band saw operation in recently completed Hacksaw, Band Saw, Band Knife and Flat Stock division plant. (Photo of plant on next page.) Left to right are: Allen E. Hastings, treasurer; William J. Greene, vice president; Wallace Findlay, asst. treasurer; Arthur H. Starrett, president.

Shown in operation in the tool room of a large automobile Master Super Service Radial Drill built by The Cincinnati Bickford Tool Co., Cincinnati, O. This particular Drill has 8-foot arm, 22-inch diameter column, and is being used in the building and maintenance of large automotive body dies.

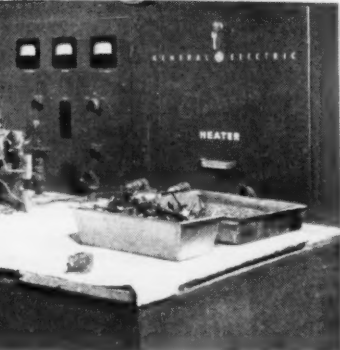
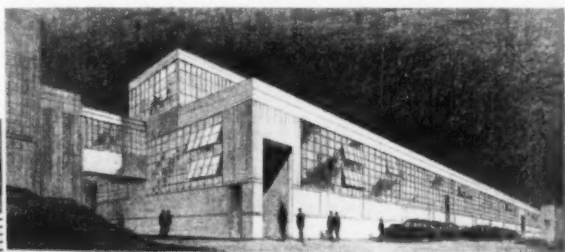
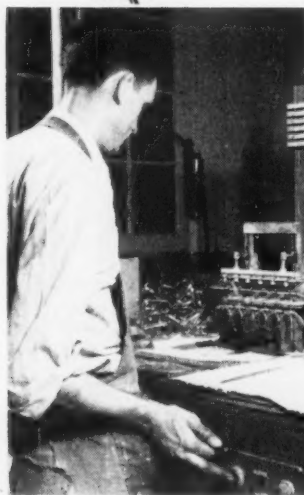


American Drill Bushing Co., Los Angeles 11, Cal., opens its new, modern office headquarters and manufacturing plant at 5107 Pacific Blvd. Additional space has been gained to house more equipment, and provide sufficient storage space for maintaining a complete stock of bushings for immediate delivery. Ample parking space is provided for visitors and personnel. With the increased production facilities gained as a result of the new plant, American becomes the largest drill jig bushing manufacturer in the West.



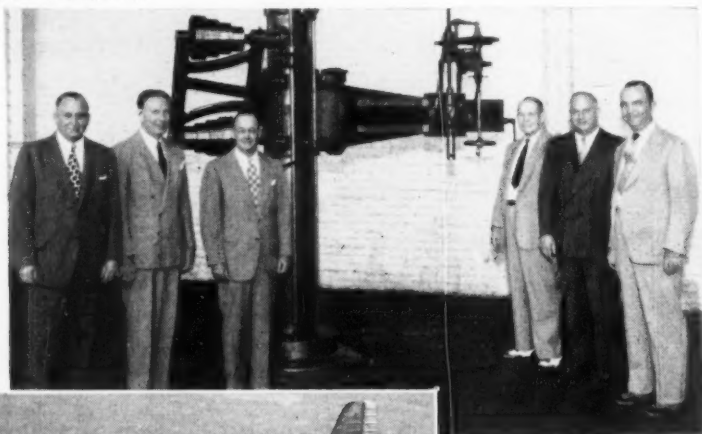


(Top) Operator is measuring unbalance on compressor rotor for jet engine on a Gisholt model JP balancing machine. (Left) The TG-190 torpedo-shaped jet engine produces approximately 10,000 hp at top speed. Engine has about 5000 lbs. thrust. (Bottom) Starrett's new Hacksaw, Band Saw, Band Knife and Flat Stock Div. is 114 feet wide x 408 feet long, made of concrete, steel and special heat resistant glass. Straight line production and continuous flow of material from the raw steel to finished goods highlights the plant operation. New plant has reduced production travel by 80% over previous methods:



Beater-blade assemblies being brazed with G-E electronic induction heater at Hunter-Spring Co., Lansdale, Pa. An average of 1800 beater blades are brazed per 8-hour shift. Heating cycle for brazing blade-stem joints on six beaters is 11 seconds. For brazing batter guards to the stem: 12 seconds.

Officers of the Cincinnati Bickford Tool Co., Cincinnati, O., are shown with an early universal type radial drill which is maintained in good condition despite its three-quarters of a century age. This noted Cincinnati machine tool builder is celebrating its 75th anniversary. Left to right are: L. Lee Schauer, vice president; Paul E. Heckel, secretary; Neil C. Schauer, vice president; George P. Gradolph, chairman of the board; Ozni E. Schauer, president; C. Carlton Slete, assistant treasurer.



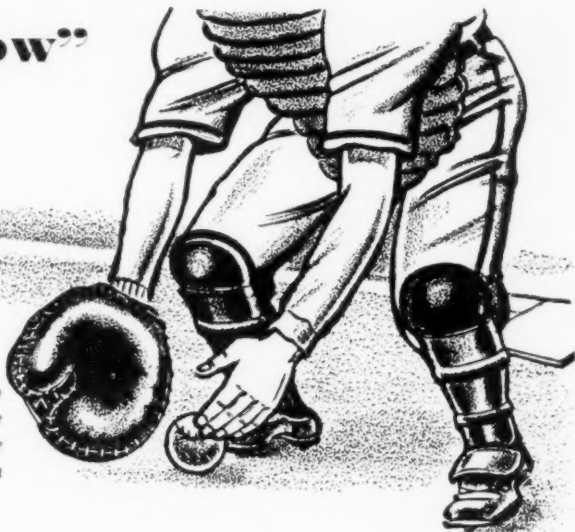
Hall flying automobile cruises at 130 miles an hour and carries 4 persons. A 190-hp engine is installed on the flight section, and a separate 26½-hp. engine is located in the car for ground operation. Flight section can be removed. The flying automobile has a wingspan of 35 feet and weighs 2535 pounds.



This Airway car has been developed by T. P. Hall Engineering Corp., San Diego, Cal., to sell in the \$500 to \$686 price range. Powered by an economical 10-hp air-cooled aluminum engine for scooter-type operation, the Airway travels 45 miles per gallon of fuel and 45 miles an hour. It has a fluid drive (no clutch pedal), and shock absorbers for easy riding. Built mostly of aluminum-alloy and plastic materials, the car weighs only 775 pounds . . . measures 158" long and 58" wide.

"Know How" does it

A smart catcher takes no chances with a bunted ball. He scoops it into his mitt before fielding it, instead of trying a bare hand pickup.



Get the "Know How" of Torit experience and design with Torit Dust Collectors

Like smart catchers you, too, cannot afford to take chances. Abrasive dusts in your plant lower employee morale, and damage machinery and finished parts. They will be eliminated when you use Torit Dust Collectors.



Self-contained Torit Dust Collectors fit every production layout. Initial installation expenses are low and operating and maintenance costs are most economical.

If you use standard grinding, polishing and cut-off machines, a Torit Dust Collector for your needs is immediately available. Torit experience can also create special adaptations for special problems. It will pay you to outline your problem to:

TORIT

Manufacturing Co.
303 Walnut St., St. Paul 2, Minn.

P. S. Also ask for the latest Torit catalog

Modern Tools in action

42-SPINDLE HORIZONTAL MACHINE

LeMaire Special Two Way 42-Spindle Horizontal Machine with shuttle fixture roughs and finish bores large hole, faces ends, drills and reams bolt holes from outside and spotfaces bolt holes from inside on axle.

Machine consists of fabricated steel center base with two side bases each of which supports 2 No. 5000 Twin Ram Units. Center base carries 3-station shuttle-type fixture and special rear drilling unit used in spotfacing holes from inside of axle ends.

1st Station

Unload and Load

L. H. Front Unit

Rough and finish bore center hole
Face end using crossfeed tool

R. H. Front Unit

Rough and finish bore center hole
Face end using crossfeed tool

2nd Station

L. H. Rear Unit

Drill 6 holes in end bolt circle
Rough counterbore center pilot hole

R. H. Rear Unit

Drill 6 holes in end bolt circle
Rough counterbore center pilot

3rd Station

L. H. Rear Unit

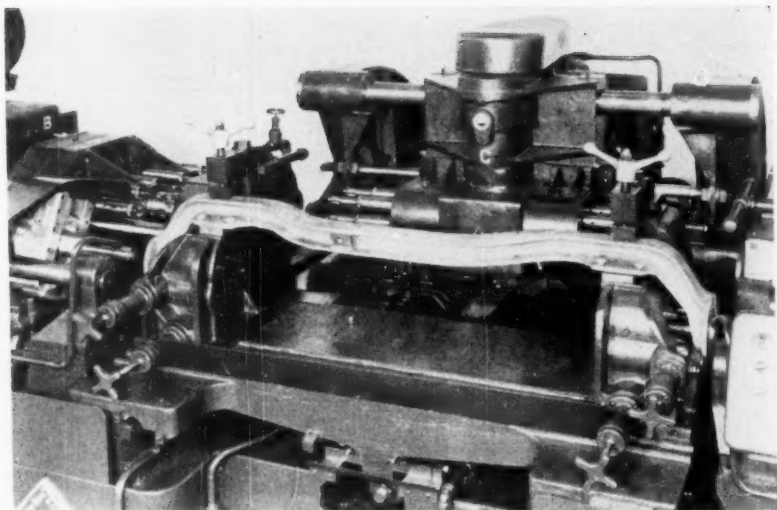
Ream 6 holes in end bolt circle
Finish counterbore center pilot hole

R. H. Rear Unit

Ream 6 holes in end bolt circle
Finish counterbore center pilot hole



Over all view of the special machine which rough and finish bores large holes, faces ends, drills and reams bolt holes from outside, and spotfaces bolt holes from inside.



A close-up of Le Maire's special machine showing the truck axle in position, as well as the various work stations.

Center Rear Unit Tilt

Spotface 6 holes from inside at 1° angle
Spotface 6 holes from inside at 1° angle

An interesting feature of this machine, made necessary by the camber of the axle of 1° from horizontal on each wheel mounting surface, was the necessity of angling all outside units down 1° and providing a center rear unit mounted on bars that would spotface at 1° up from horizontal feeding to the left, would tilt to 1° up from horizontal in the opposite direction and feed to the right.

The boring and facing spindles at the front station also have some unusual

features. By means of an auxiliary hydraulic cylinder a pilot for the boring tool is carried thru the hole to be bored and enters a pilot bushing. The feed of the unit rough and finish bores the large hole bringing into position a special cross facing tool. Continued feed causes single point tools to feed across the face. There are three of the tools performing rough, semi-finish and finish cuts.

The electrical equipment is arranged to carry the work automatically thru the entire machine cycle after the part has been clamped in place and the cycle button is pushed.

Production is approximately 10 axles per hour.

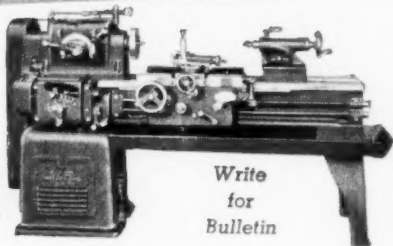
CARROLL and JAMIESON

Lathes

12 Speed Geared Head
Motor Drive Timken Mounted
Spindle.

Modern Design —
Liberal Dimensions.

Carroll & Jamieson Machine Tool Co.
BATAVIA, OHIO, U.S.A.



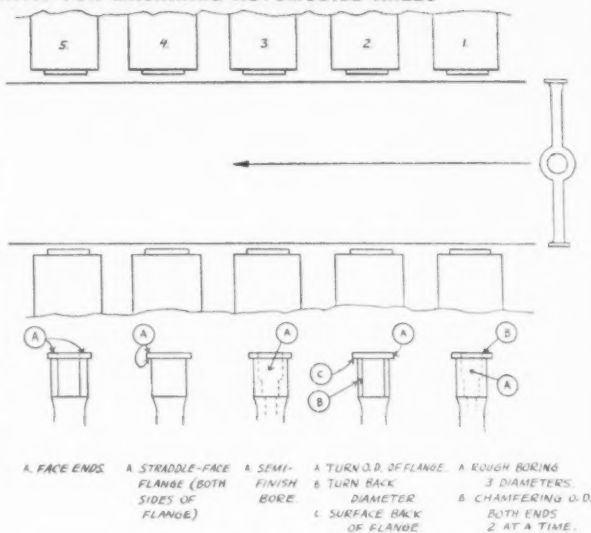
Write
for
Bulletin

TRANSFER-MATIC FOR MACHINING AUTOMOBILE AXLES

A new special machine tool produces 150 rear axle housings hourly with only one operator. This Transfer-matic consists of five two-station double-end machines in combination with a unique transfer mechanism. The operations are rough and finish boring the wheel bearing seats, turning the outside diameter of the end flanges, turning the bolt clearance behind the end flanges, rough straddle facing and finish facing the end flanges.

Performing in automatic cycle, the parts are picked up by the transfer mechanism, advanced from one machine to the next, located, clamped, and machined. In all, 20 parts are transferred simultaneously. The transfer mechanism moves the work from machine to machine only. Locating and clamping are left to the work holding fixtures which are integral with each individual machine. To save time, the transfer mechanism lowers out of the way and returns to the loading position during the machine cycle. The operator has only to load the parts and press the cycle start button.

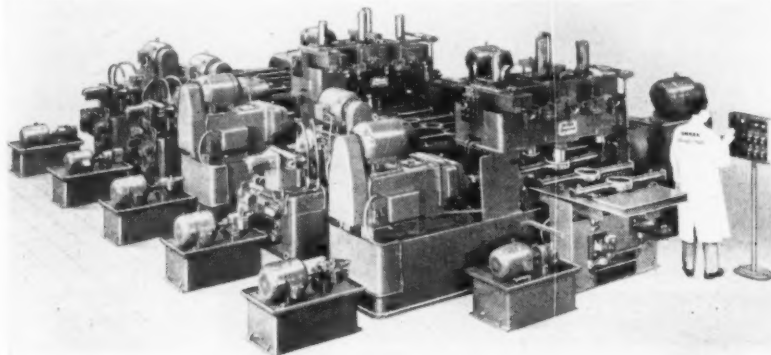
Coolant and chips are handled through a centralized system located beneath the floor. An idle station is provided between



Diagrams show the work stations and the various operations which are performed by the Cross Transfer-matic.

each of the machines for accessibility and to allow for the removal of parts between operations if desired. Cross standard self-contained units are used wherever possible to provide maximum flexibility for future design changes. Carbide tools, hydraulic feeds, and hardened and ground steel ways are used throughout.

Photo of the Transfer-matic which machines 150 rear axle housings hourly with but one operator.



DRILLING 441 HOLES IN ACOUSTICAL TILES

The problem is to drill, all at one time, 441 holes in 12" x 12" acoustical tiles. Hole diameters are 3/16", 21 rows in each direction.

The heart of the machine used is a Zagar drilling head. The performance of the machine was built around the ability of this drill head to turn a great number of spindles at relatively close centers.

The tile is manually loaded into the hopper and is then hydraulically positioned for drilling and then hydraulically ejected. The 411 spindle drill head is directly driven with a 10 h.p. pancake type electric motor. The ram is hydraulically actuated through a central hydraulic control system which is located in the base of the drilling machine. The length of stroke, depth of drill and the rate of speed are hardened and ground whenever practicable and advisable. Other parts are the welded steel tank, welded steel ram plates and drill bushing plates. Automatic cycling is obtained through the use of electric limit switches and electrical controls plus



solenoid-operated hydraulic valves. Chip disposal is controlled with built-in vacuum and blower ducts.

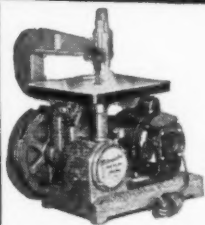
Production is between 20 and 40 tiles per minute.

John W. Jessen, Iron Mountain, Mich. has been appointed representative in the Upper Peninsula to handle drill jig bushings, steel stamps and marking devices as produced by Colonial Bushings, Inc., and New Method Steel Stamps.

Appointment of Norman S. Taber as managing director of the United States Council of the International Chamber of Commerce was announced recently by H. J. Heinz II, Chairman of the organization.

MILWAUKEE

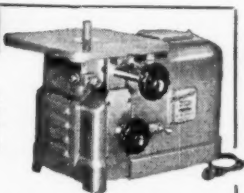
DIE FILERS PROFILE GRINDERS



CUT Tool and Die Making Costs

Users report savings up to 60% on MILWAUKEE Die Fillers for filing, sawing and lapping. The Profile Grinders repair dies, grind cams, grind and finish grind hardened steel parts.

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Division of Milwaukee Chaplet & Mfg. Co.

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Shop Hints

NOSE GEAR PISTONS SALVAGED BY MACHINISTS' INGENUITY

An interesting operation has been developed at Texas Engineering & Mfg. Co., Inc., Dallas, Texas, for replacing damaged C-54 nose wheel piston cams.

In this assembly the cams are attached to the pistons with studs, and in the original manufacture the cam and piston are drilled and tapped together and the threads in the cam are tapped and mated to the piston. As a result the position of the thread is different for each stud receptacle, which makes it impossible to tap the replacement cam by normal procedures.

When Temco first came up against this obstacle, it appeared that the only solution would be to scrap the entire assembly each time a cam was damaged, but machinists refused to take this easy way out and instead evolved a unique procedure which has saved many thousands of dollars worth of pistons.

A blank cam is laid out with a height gage and sine plate to match the particular piston on which it will be used. It is then drilled to the minor diameter of the $\frac{3}{8}$ " pipe thread with which the piston is tapped. Next the cam and piston are

mated and a $\frac{5}{8}$ -18 thread tap, which cuts a shallower thread than the $\frac{3}{8}$ " pipe thread tap is used from inside the piston to pick up the lead of the piston thread and score the inside of the holes in the cam. Using the score as a guide, it is then easy to tap in the $\frac{3}{8}$ " pipe thread from the outside and mate it as perfectly

• • •

Fig. 2. The new cam is drilled to the minor diameter of a $\frac{3}{8}$ " pipe thread.

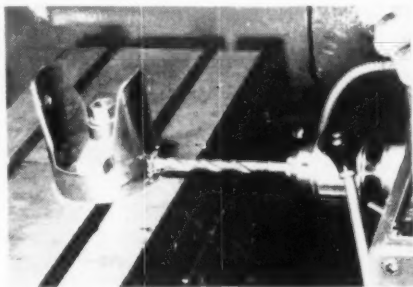


Fig. 1. The blank cam is laid out with a sine plate and height gage using the old cam as a template.

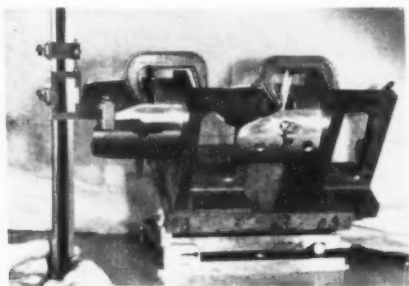
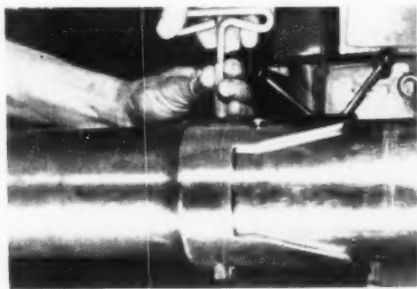


Fig. 3. The new cam is mated to the piston and tapped from the inside with $\frac{5}{8}$ -18 tap to pick up thread lead and mark cam.



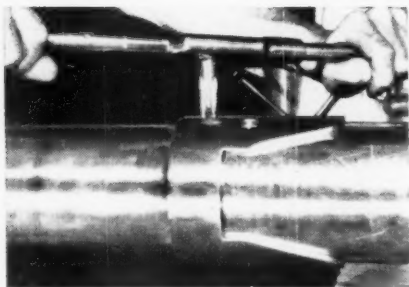


Fig. 4 Using mark left by $\frac{5}{8}$ -18 tap, cam is now tapped from outside with $\frac{3}{8}$ pipe thread tap.

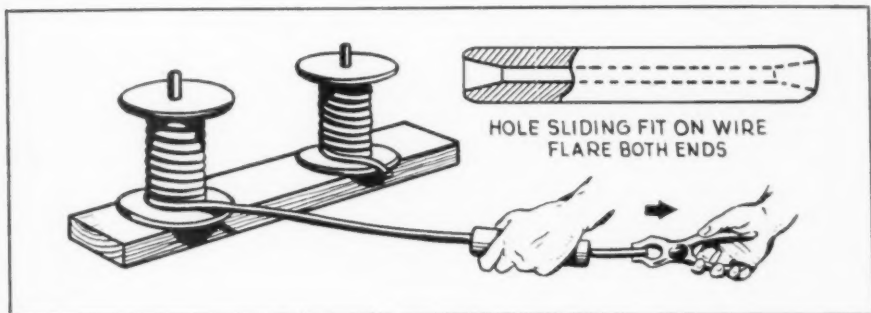
to the thread in the piston as that of the original cam.

Since the cam is a very minor part of the piston assembly, the savings achieved by this Temco procedure have been spectacular.

A SIMPLE WIRE STRAIGHTENER

by Rudolph G. Kopp

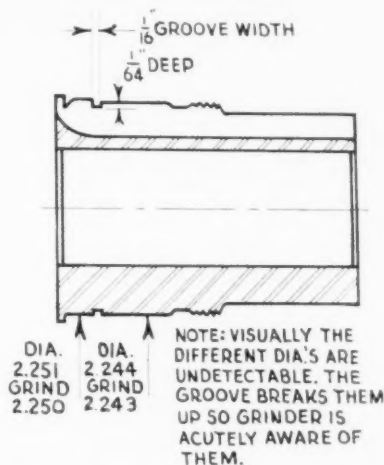
This wire straightener was a great help and speeded up work in wiring a large switchboard panel. The wire, No. 14 solid copper with a heavy plastic insulation, came wound tightly on small spools and, probably due to the nature of the insulating material, was unusually springy. To facilitate straightening we drilled a hole lengthwise through a 4" metal bar just large enough to be a sliding fit on the wire. The holes of the bars flared on both ends. When using we threaded the wire through the hole and pulled the wire out to the length desired.



HOW TO ELIMINATE SCRAP LOSS WHEN GRINDING HUBS OR SHAFTS

by George Pheil

When adjacent diameters have only a few thousandths difference in grind diameter tolerances, the grinder operator is lulled into an absence of awareness and grinds both diameters the same. The result . . . scrap! This mental lapse can be solved by tooling narrow, shallow grooves separating the two diameters.



The cost of extra tooling of this groove is negligible due to the machining set-up; but as aid to focus attention of the grinding operator on the slight difference of diameters, it is indispensable in reducing scrap losses.

A Welded Construction Drill Jig

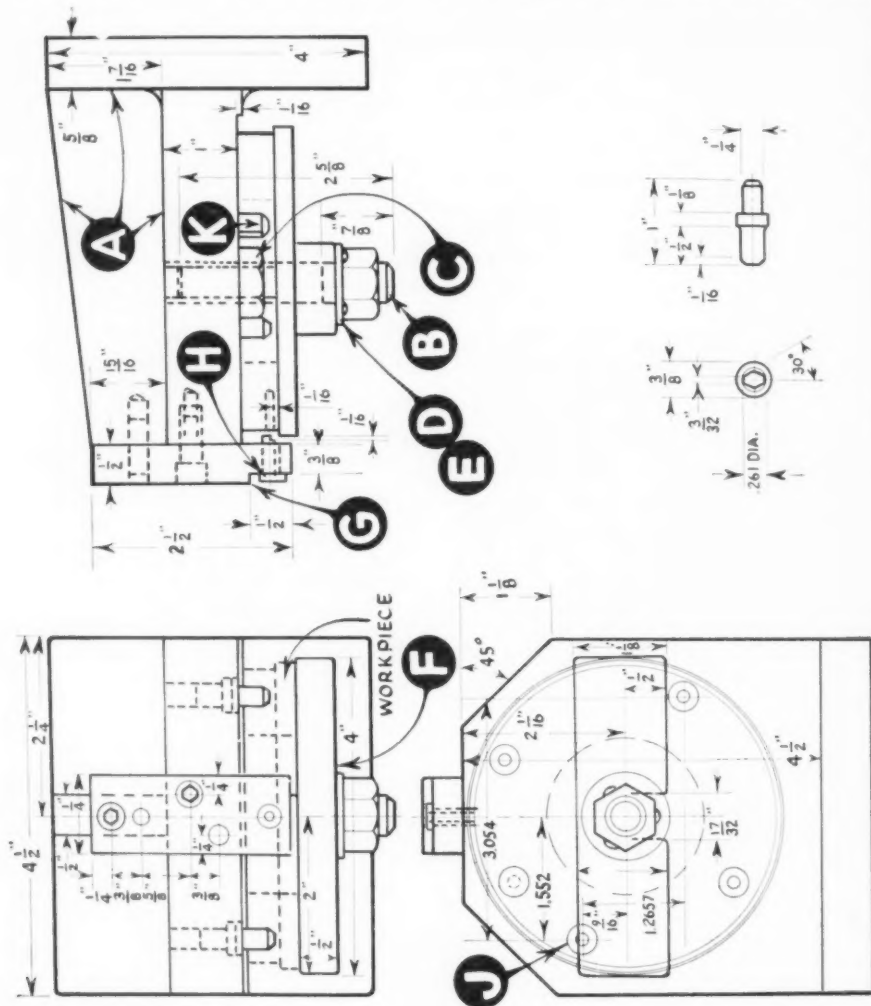
Robert Mawson

Machines, jigs, and fixtures, are now being fabricated in many plants by welding. This method has several advantages; tools can be built without necessity of making patterns for subsequent castings, they can be made faster, they are frequently more economical.

In the illustration is shown a welded

construction drill jig for machining the detail shown in position in the tool. It was built by the Triangle Tool Die and Engineering Co., South Bend, Ind.

Three pieces of machine steel are used to finish to the following sizes: $1'' \times 4\frac{1}{2}'' \times 4\frac{1}{2}''$; $\frac{1}{2}'' \times 1-7/16'' \times 4\frac{1}{2}''$; and $\frac{5}{8}'' \times 4'' \times 4\frac{1}{2}''$. These steel sections are provided



with material for finish on the several surfaces. These rough machine steel pieces are then normalized and next welded to form the jig body shown in "A". This is then finished on the surfaces "f" so that the top face will be parallel with the bottom surface and also the horizontal face in proper alignment.

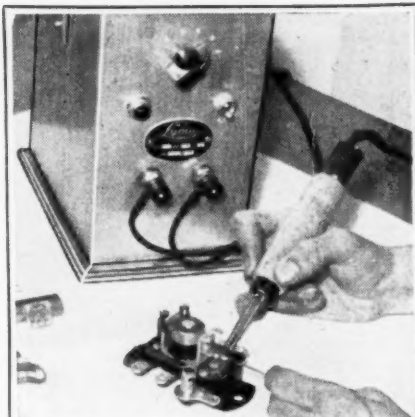
A hole is then drilled and tapped in the vertical member in which is placed a $\frac{1}{2}$ inch stud "B", threaded on both ends, which is held in position in the jig with a hexagon nut "C". A steel washer "D" is tack welded onto a hexagon nut "E" which is screwed on the stud. The workpiece holding strap "F" is made of machine steel and a slot has been provided, at the under side of the slot, so that the strap can be removed without screwing off the nut from the stud.

On the upper surface of the jig body, and fastened with two socket head screws and two dowel pins, is the machine steel bushing plate "G". In this plate is accurately located a tool steel, hardened and ground bushing with a hole for grinding a .070 inch drill. The workpiece is located in the jig with two tool pins "J" and "K". The pin "J" has been ground to be a good sliding fit for a .262 inch hole. The second of the pins also is a sliding fit for .262 inch, but this pin has been machined with 30° reliefs in order that the casting can be placed on the jig or removed from the tool more easily and yet retain the locating feature.

To use the drill jig: for the previous operations the workpiece has been bored with a two inch hole, faced on both sides, and turned on the periphery. For the next operation five holes have been reamed with .262 inch holes. The piece is then ready for drilling the .070 inch hole with the jig illustrated here. This hole must be accurate with the .262 inch reamed holes and with the rear surface of the piece.

The nut "E" is first screwed back for a short distance and the strap "F" removed from the stud "B". The piece is now placed in the jig being located with the pins "J" and "K". The strap is then returned into its position on the stud, and when the nut is tightened against the strap the workpiece is pushed back and held in the drilling position.

The .070 inch hole is then machined in the workpiece, the drill being guided in the bushing "H". To remove the finished drilled piece it is only necessary to screw back the nut a sufficient distance to take off the strap and the piece can be slid off the two locating pins.



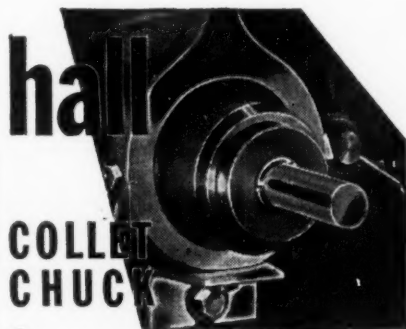
FOR FASTER, SAFER SOLDERING

The Luma resistance method of soldering is the accepted way for small shops requiring single operation to large plants with many types of operations. Write for complete information about this remarkable tool.

LUMA ELECTRIC EQUIPMENT CO.

P. O. Box 132-H

Toledo 1, Ohio



SPEED UP production in multiple operations with push-out type Hall Collet Chuck. Full spindle capacity or over. Tremendous grip over or under stock size to .007—without adjustments...no bearings, friction, heat or loss of power. Instant release without stopping lathe.

2-inch capacity, \$145; 3-inch capacity, \$295;
1-inch capacity, \$95

Round, square or hex collets, plain-serrated

HALL MANUFACTURING COMPANY

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Available Literature

CATALOGS, BOOKS AND INDUSTRIAL FILMS.....

1. Features of Catalog "M" are the table of cutting speeds, speeds and feeds for high speed circular saws, millimeter conversion tables, table of decimal equivalents and speed conversion table for carbide saws. Also line of circular metal cutting saws, combined center drills and counter sinks, and reamers. **Circular Tool Co., Inc., Providence 5, R. I.**

2. "Products for the Stone Industry" describes the latest methods of cutting, grinding, polishing, buffing, and pressure-blasting stone. It covers Norton abrasive products and their applications in the granite, marble, limestone, sandstone, soapstone, and slate fields. Miscellaneous operations, such as engraving, hand rubbing, and tool sharpening are included. **Norton Co., Worcester 6, Mass.**

3. Typical of some of the irregular shapes furnished by Ryerson's are Diesel locomotive parts, sprockets, grinding wheels, boom bars, crank shafts, machine and equipment frames, and ornamental pieces. Shapes cut with the Electric-Eye machine are sharp, square cornered and accurate; resulting in savings in fabricating costs and opening up new opportunities to use parts made of rolled steel. **Joseph T. Ryerson & Son, Inc., Box 8000-A, Chicago 80, Ill.**

4. In addition to a complete description of the 7" bench shaper, a 3-drawer steel stand, motors and tools are shown in Bulletin No. 500. Ram has 0-7" stroke; 42, 75, 120 or 195 strokes per minute. Cutting speeds from 3 to 114 feet. **South Bend Lathe, South Bend, Ind.**

5. Tri-Clad single phase capacitor motor has reduced weight and dimensions. Capacitor is mounted in base, conduit box has been replaced by terminal board inside of end shield. Transfer mechanism is totally enclosed for protection from foreign matter. **General Electric, Schenectady, N. Y.**

6. No. 50 WYCO Catalog contains complete information on many new models of single and multiple speed flexible shaft machines and grinders. Parts and accessories are illustrated for better understanding, with explanatory details on grinding, sanding, wire brushing, polishing, de-burring and many other operations. **Wyzenbeek & Staff, Inc., 838 W. Hubbard St., Chicago, Ill.**

7. Covel boring machines have automatic controls for boring, turning, facing (or any combination of these operations). Flexible electric-hydraulic circuit is used to perform the following functions—start, rapid traverse, coarse feed, dwell, rapid return, stop. A combination variable displacement and positive volume pump is used. Push-button control automatically starts and completes cycle. **Covel Mfg. Co., Benton Harbor, Mich.**

8. Single, double and triple enclosed helical gear drives are available in 42 sizes with standard ratios ranging from 2.08/1 up to 360/1. Full specifications and illustrations given. **Footo Bros. Gear and Machine Corp., 4545 S. Western Blvd., Chicago 9, Ill.**

TAPS WON'T BREAK



with the JAY-DEE Tapping Attachment

Jay-Dee employs an entirely new clutch principle, designed specifically to eliminate tap breakage. Instead of using coiled springs to provide driving pressure, it has a resilient material . . . 150 times more effective than steel . . . to produce safe torques at all times. This new attachment is simple as well as safe; definite torque settings for given tap sizes and taps can be changed in a few seconds without wrenches.

Can be used for horizontal or vertical tapping, stud driving, blind or through holes—on all reversible machines.

LARGE TAP RANGE

K-1 unit handles taps $1\frac{1}{2}$ "- $1\frac{3}{4}$ " USS, a range normally requiring three attachments. Other units also available.

Guaranteed for 12 Months!

FREE

Bulletin with full details.
Yours for the asking.

THE Wickman
MANUFACTURING CO.

15533
WOODROW WILSON AVE.
DETROIT 3, MICHIGAN

9. Hollow spindle lathes, 16"-20", have 18 selective speeds ranging from 10 to 362 R.P.M. with 20" headstock. Tailstock has handle set at angle by means of worm and rack construction, thus allowing bar stock to pass through spindle hole. **The R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.**

10. "Magna Ground" is a permanent Alnico magnet designed to serve as a clamp for the ground cable of electric welders. Taking up to 600 amps, the Magna Ground is easily attached to the cable with set screws or silver soldering; is claimed to reduce amperage needed by

increase production, reduce costs and improve quality. Included in the brochure is a description of Lincoln Park's die-making facilities and an illustration of the variety of products that can be made more economically with carbide dies. **Lincoln Park Industries, Inc., Lincoln Park 25, Mich.**

14. Continental Industrial Engineers, Inc., have issued a new twelve-page booklet describing in detail the scope of their services to industry. Included are many illustrations with detail descriptions of a wide variety of production lines and automatic processing equipment. **Con-**

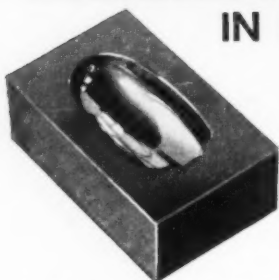
providing a positive ground. **Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 14, Wis.**

11. Recovery of industrial waste screenings is automatically accomplished with the Link Belt bar screen. Rakes that clean through the bars from the back remove large solids from water under treatment, lift the collected waste to a wiper, which in turn deposits the load in receptacle or conveyors. **Folder 2327, Link Belt Co., 307 N. Michigan Ave., Chicago, Ill.**

12. Broach sharpening machine, designed to recondition round type broaches by rotating the broach between fixed centers and positioning the grinding wheel from tooth to tooth, is described in Circular 800. **American Broach & Machine Co., Ann Arbor, Mich.**

13. Six separate case studies show how carbide dies

Only **HYPREZ** Can
Do a **HYPREZ** Job!



IN FINISHING DIES, MOLDS, TOOLS, GAGES, PARTS

All finishing operations—from rough to mirror polishing—are quickly and economically achieved with HYPREZ DIAMOND COMPOUNDS.

They assure finest quality, uniformity, speed and economy on any job—difficult or simple.

Precisely engineered standards perfected by our laboratories are available in 18 and 5 gram cartridges, fully color identified and dust proof—for use with the original Hyprez Applicator Gun.

TECHNIQUES for Lapping and Polishing



Proven Hyprez techniques are described and fully illustrated in this new folder—showing fast, effective, simple methods—without the use of special equipment.

Write for a demonstration or for Technique Folder No. B-150

HYPREZ DIAMOND COMPOUNDS

AN EXCLUSIVE PRODUCT OF

HYPREZ DIVISION

ENGIS EQUIPMENT CO., 431 SOUTH DEARBORN ST. CHICAGO

tinental Industrial Engineers, Inc., 176 W. Adams St., Chicago 3, Ill.

15. Illustrated with more than 25 photographs, sketches and tables, a new booklet on Heliwelding explains the process and when to use it. The booklet also contains sections on equipment for manual, semi-automatic and automatic operation; a new automatic filler-wire feeder, and power supply equipment. **Air Reduction**, 60 East 42nd St., New York 17, N. Y.

16. Standard code symbol stamps for identifying inspectors, operations, workmen, dates, and specially designed stamps for indicating acceptance, rejection, deviation and other inspection markings are made of "Mecco Safety" steel in regular or wedge grip styles. **M. E. Cunningham Company**, 228 E. Carson St., Pittsburgh 3, Pa.

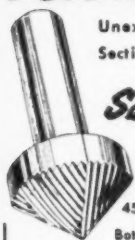
17. The 32 standard sizes of **GLENNY** broaches are listed in Catalog No. 12 with complete specifications on each. Engineering data explains how broaches can be used in conjunction with standard bushing-type adapters to cut keyways in bores larger than broach diameter and with special adapters to cut (1) tapered keyways in straight bores, (2) straight keyways in tapered bores, and (3) tapered keyways in tapered bores. **Kase Machine Co.**, 18428 Buffalo Ave., Cleveland 19, Ohio.

18. Katolight motor generator sets are of interest to large industrial plants, particularly for production testing of electrical devices requiring special voltages and frequencies. Form 549-MG describes converters, motor generators and high frequency generators. **Kato Engineering Co.**, 1415 First Ave., Mankato, Minn.

19. All **Di-Acro** brakes can now be converted into a precision box and pan brake by using the new **Di-Acro** box finger bar in place of the solid top bar

Severance DEBURRING CUTTERS

HIGH SPEED
CARBIDE



Unexcelled for power and hand deburring
Sectional pattern teeth give shearing action

Severance INSIDE DEBURRING CUTTERS

GROUND FROM THE SOLID

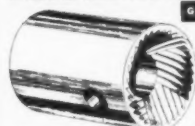
Select 45° High Speed cutters from
28 standard sizes and 30° cut-
ters from 35 sizes—from 1/4"
to 3" diameters.

Both angles can be supplied in CARBIDE



Severance OUTSIDE DEBURRING CUTTERS

GROUND FROM THE SOLID



For speedy light deburring of rod
ends and tubing O.D.'s, either off-
hand or in screw machines. Select
30° cutters from 14 standard sizes
and 45° cutters from 10 sizes—up
to 4 inch diameter.

ANGLES 30° & 45° C/L

Both angles can be supplied in CARBIDE

OUTSIDE CHAMFERING MILLS

Operate in machines to perform
heavy chamfering without chatter
—in above size range and angles.



HEADQUARTERS FOR DEBURRING AND
CHAMFERING TOOLS DEVOID OF CHATTER

Severance HAND DEBURRING CUTTERS



"A Twist of the wrist"
easily bites off the bur left
by drill or punch.

Ten standard sizes for 1/4" to 2" diameters.

Write for Bulletin 16-D

Complete REGRINDING Service — by New Tool Craftsmen
— Savings are thus multiplied —

SEVERANCE TOOL INDUSTRIES, Inc.

722 Iowa Ave.,

Saginaw, Michigan

MIDGET MILL GROUP

GRINDING FROM THE SOLID

MIDGET MILLS



TUBING GROUP

STANDARD Chamfering



COUNTERSINK GROUP

STANDARD



BALL SEAT REAMER

vaults, silverware,
road machinery,
etc. The Hydraulic
Press Mfg. Co.,
Mount Gilead,
Ohio.

21. Bores are ground on the principle of the planetary spindle with the Hauser Jig Grinder, Type 35. The grinding spindle is fixed at the end of the inner planetary spindle and is interchangeable. The maximum speed is 75,000 r.p.m. Hauser Machine Tool Corp., Manhasset, N. Y.

22. Sterling grinding segments, in various combinations of grain, bond and structure, have an interlocking design for added strength and cooling. Catalog describes various sizes of No. 2 chucks and segments. The Sterling Wheel Grinding Division, Tiffin, Ohio.

23. Special tools such as expanding mandrels, special spring chucks, milling machine adapters, special

collets, sleeves and chuck jaws, and screw machine collets are given with illustrations of each. Second half of Catalog No. 17 is devoted to specifications and list prices of collets and fingers for Brown & Sharpe, Acme, Acme-Gridley, Gridley, Cleveland, Cone, Davenport, New Britain, New Britain-Gridley and Warner & Swasey and Swiss type automatics. Sutton Tool Co., Dept. 000, Sturgis, Mich.

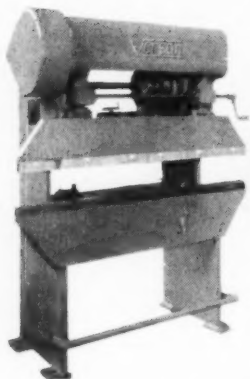
24. Improvements on the complete line of Bliss open back inclinable presses, from

supplied with all standard Di-Acro brakes. This box finger bar contains fingers graduated in size so that they cover the entire box forming range from 1/2" to the maximum size of each model Di-Acro brake by 1/8" steps. O'Neil-Irwin Mfg. Co., Lake City, Minn.

20. "Case Studies in the Reduction of Metal Working Costs" embraces a wide variety of production problems and their solution on such products as home appliances, motor cycles, beer barrels, agricultural machinery, kitchenware, burial

BIG PRESS BRAKE DESIGN

SMALL BRAKE COST



Shops that are wasting manpower with hand brakes or tying up big machines with small odd jobs have the answer to their problems in the new Verson 16-48 Press Brake. Compact and low in cost, the 16-48 brings the advantages of power operation and big brake design to smaller shops. Bed and ram length is 48". Capacity ranges from a 48" length of 16 ga. steel to a 24" length of 10 ga. steel. Allsteel construction assures perfect alignment and maximum rigidity. Write for a copy of Bulletin 16-48A; it gives complete design details, specifications and capacities.

VERSON ALLSTEEL PRESS CO.

9303 S. Kenwood Ave.
CHICAGO 19, ILLINOIS

Holmes St. and Ledbetter Dr.
DALLAS 8, TEXAS

THERE'S A VERNON PRESS BRAKE FOR EVERY JOB
FROM 15 TONS UP!

10 to 200 tons capacity, have been stressed in the new 24 page illustrated catalog No. 2-C. An entire section of the catalog has been devoted to the various component parts and accessories. E. W. Bliss Co., Toledo 7, Ohio.

25. Morton 72-page catalog illustrates complete line of jack locks, fixture clamps and standard details with photographs, diagrams and tracing templates and specifications. Morton Machine 2421 Wolcott St., Ferndale 20, Mich.

26. Engineering Manual No. 10 includes

duction and maintenance men information relating to new uses for existing types of flexible metal hose and development of new types of hose. Catalog covers recent developments in interlocking and seamless hose as a flexible medium for such applications as diesel exhausts, conveying liquids, gases, solids and semi-solids; and in heat and pressure problems. Atlantic Metal Hose Co., 123 W. 64th St., New York 23, N. Y.

29. Booklet describes 10 "standard" grades of Diamond liquid silicates of

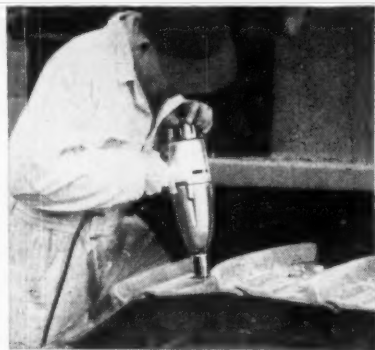
dimensional drawings on all models of collet fixtures, broaching machines and multiple spindle gearless drill heads. Also included in this new manual are photographs and data sheets of keyway broach standards for 20" and 36" horizontal broaching machines. Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland, Ohio.

27. "Move More for Less" is the title of the 32-page belt conveyor bulletin No. 1400, on stationary, portable and 16 types of special purpose belt conveyors (both troughed and flat belt). Included are future applications and methods of selection of belt conveyors; dimensions, weights and specifications. Lippman Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

28. Catalog 100 on Flexible Metal Hose is designed to pass on to pro-

PAID FOR ITSELF IN 73 HOURS OF USE

on a tough nut
running job



IMPACTOOL

**DID IT WITHOUT
KICK OR TWIST**

A tractor dealer, servicing cleat-type machines, ran up 500 nuts and cap screws per tractor... requiring 10 hours of fatiguing work with hand wrenches. The I-R Impactool was demonstrated and purchased after the job time was cut in half. The dealer figured that the Impactool paid for itself on 14 units... or 73 hours of use... an easy way to put more profits into the cash register.



KIT No. 1—IMPACTOOL, with standard equipment, plus a complete assortment of attachments in a Handy De Luxe Case. 110V or 220V, AC or DC models available. 432-10

A MULTI-PURPOSE TOOL

Actually, the Impactool saves many additional hours of time and hard work because the powerful rotary impact blows take the drudgery out of many other service and repair operations such as reaming—tapping—screw driving—wood boring—drilling—hole sawing—driving and removing studs—extracting broken studs and screws—wire brushing—drilling masonry—etc.

You can increase your profits with these easy-to-use, time-saving Impactools that everyone is talking about. Ask your Ingersoll-Rand distributor for a free demonstration.

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

ORIGINATOR OF IMPACTOOLS—air and electric

soda. Data presented in each grade summarizes its principal physical properties, major industrial applications and basic advantages provided. Allied products similarly treated include Diamond's special concrete silicate, silicate of soda glass, special liquid silicates of soda, and three grades of granular silicate of soda. **Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio.**

30. Bellows BGF-5 power feed is a packaged "controlled air power" feeding unit designed to replace manual feeding in heavy duty drilling, milling and grind-

ing operations. Unit consists of air motor, hydro-check, time controls, lubro-unit, and start and stop switches. **The Bellows Co., 222 W. Market St., Akron, Ohio.**

31. Examples, histories and types are described in bulletin on Speed-aire fan-cooled, worm gear speed reducers. Catalog 300. **The Cleveland Worm and Gear Co., 3293 East 80th St., Cleveland 4, Ohio.**

32. Speed and ease of adjustment and replacement are features of inserted blade cutters. Types of tools offered in wedge and blade type cutters are boring heads, core drills, reamers, hollow mills, face mills, end mills and counter-bores. **Johnson Tool Co., 13001 Plymouth Rd., Detroit 27, Mich.**

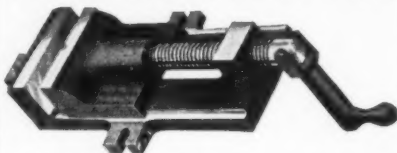
33. Two models of Jigmils, for boring and reaming, are described with specifications and accessories in a 20 page catalog put

out by DeVlieg. The Jigmil has many automatic functions, enabling quick operator training and top performance. **DeVlieg Machine Co., 450 Fair Ave., Ferndale 20, Mich.**

34. Diagrammatic illustrations and specifications are shown for the Gwilliam line of ball and roller bearings in Catalog No. 50. Eleven types of bearings are shown in all. **The Gwilliam Co., 360 Furman St., Brooklyn, N. Y.**

35. Carburit pack-hardening paste and Isopac isolating paste are illustrated as

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, Inches	Opens Inches	Weight Pounds
1D	3½	3½	12½
2D	5	5½	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

YOST MFG. COMPANY

1335 SO. MAIN STREET
MEADVILLE, PENNSYLVANIA

ALMOND DRILL CHUCKS



Maximum gripping power with extreme accuracy and long life.

Write for Catalog

T. R. ALMOND MFG. CO.
ASHBURNHAM, MASS.
U. S. A.

to use and application in a six page folder. Carburit is a non-poisonous, rapid penetrating carburizing product. Iso-pac keeps desired sections soft in the hardening process. **Denfis Chemical Laboratories, Inc.**, 172 Pacific St., Brooklyn 2, N. Y.

36. **Flawmaster** is a thermosetting compound used to reclaim metal parts and castings otherwise rejected for surface flaws, sand pitting, foundry gas holes, faulty machine surfaces, taps, etc., matching the metal to which it is manually applied. Flawmaster is machineable, chemically inert, and is resistant to a wide range of temperatures. **Western Sealant, Inc.**, 9042 Culver Blvd., Culver City, Calif.

37. **Power tools** for cutting, shaping, drilling, and finishing of metal, wood, plastics and fibre are described, illustrated and specified in the **Boice-Crane Catalog No. 50**. This catalog is designed to be a buying guide for industry, small shops and schools. **Boice-Crane Co.**, 930 West Central, Toledo 6, Ohio.

WHY?

shop around for
Cap Screws • Set Screws
Milled Studs • Coupling Bolts
when you know

WHO*

has been making the finest for over half a century.

*WHO is . . .

WM. H. OTTEMILLER CO.
YORK, PENNA.

Send for Free Literature.

Literature Mentioned In This Month's Advertisements

38. **Taper boring machine** can be used with present milling machine, jig borer or boring bar. Tool can also be used for straight boring, facing or outside turning. **Tree Tool & Die Works**, Dept. B, 1600 Junction Ave., Racine, Wis.

39. **High speed tapping head** is equipped with double cone clutch which engages drive and reverses shell with cushioned action. Automatically regulated driving power is controlled by pressure application. **Procurier Safety Chuck Co.**, 14 S. Clinton St., Chicago 6, Ill.

40. **Heavy duty toggle clamps** are quick acting and versatile. Bulletin C-48 gives types and size specifications. **Wolverine Tool Co.**, 1480 East Woodbridge St., Detroit 7, Michigan.

41. **Contour saw-band filer** can be equipped with $\frac{1}{2}$ ", $\frac{3}{8}$ " or $\frac{1}{4}$ " file widths, flat or oval, and in 10 tooth styles for production or maintenance of templates, cams, spiral parts, trimming dies, etc. Filer has 8 speeds, from 92-4100 f.p.m., for proper cutting of numerous materials. **Boice-Crane Co.**, 936 Central Ave., Toledo 6, O.

42. **Case reports** on the Anderson coolant, Lusol, are available on request. Comparison made of speeds used, work units completed and various brands of coolants. **F. E. Anderson Oil Co.**, Portland, Conn.

43. The "Master Marker" embosses code numbers, names, etc. on metal tags and is available with foot or power operation. Tags are supplied in reel form and are mounted on machine for accurate, safe feeding. Bulletin D-9. **The Pannier Corp.**, 203 Pannier Bldg., Pittsburgh 12, Pa.

44. **Fast production** and wide range of automatic turning where multiple diameters, shoulders and tapers are involved is the feature Cleveland Model B. Comes in four sizes, all described in Bulletin B. **The Cleveland Automatic Machine Co.**, 4934 Beech St., Cincinnati 12, O.

45. A new electric heat treating furnace line has range up to 2000 degrees F. Furnaces also available with ranges of 2300 degrees F. **Gilbert S. Simonski**, 401 N. Broad St., Philadelphia 8, Pa.

46. **Flexible shafts** can be run along any desired path between a part and its control point, providing a simple way to drive and control machinery by remote

control. Bulletin 4501 details the selection and application of shafts. **S. S. White Industrial Div.**, Dept. H., 10 East 40th St., New York 16, N. Y.

47. **Baldor series 500 grinder** is guaranteed for two years against burn-out. A reversible, ball bearing motor has $\frac{1}{2}$ h.p. capacity. Accessories and specifications, as well as line of equipment, are shown in Bulletin 321-D. **Baldor Electric Co.**, 4368 Duncan Ave., St. Louis 10, Mo.

48. **Double end transfer machine** automatically feeds standard bar stock, cuts off accurate lengths with milled finish, and automatically transfers to equalizing, self centering jaws for accurate double-end machining. **The Motch & Merryweather Machinery Co.**, Penton Bldg., Cleveland 13, Ohio.

49. A tool that combines drilling and tapping in one operation is available in NC and NF threads in standard sizes from $\frac{1}{4}$ " to $\frac{3}{4}$ ". Drill-ream, drill-counter bore, core-ream, 2 step-core drill and drill-countersinks are also available. **Mohawk Tool Co.**, 21641 Dequindre, Hazel Park, Mich.

50. The **Nichols miller** can be used for profiling, drilling, reaming, boring, facing, key seating, broaching and vertical milling. Catalog describes five models of the machine. **W. H. Nichols Co.**, Waltham, Mass.

51. **Hyprez diamond compounds** are available in 18 and 5 gram cartridges, for use with applicator gun. Techniques for lapping and polishing of dies, molds, gages and parts are described in Technique Folder B-150. **Hyprez Div., Engis Equipment Co.**, 431 S. Dearborn St., Chicago, Ill.

52. "How to Specify and Buy Alloy Steel" booklet shows how to guard against errors in ordering. **Jos. T. Ryerson & Son, Inc.**, 7558 W. 16th St., Chicago, Ill.

53. **Type 10 TD tool grinder** is designed for minimum movement by operator. Uses heavy duty, wet or dry, 10-14" wheels. **The Standard Electrical Tool Co.**, 2486 River Rd., Cincinnati 4, O.

54. **Wells-O-Bar feed master** accurately feeds bar stock in a variety of shapes and sizes into band saw. Requires 60-80 pounds air pressure. **Wells Mfg. Corp.**, 707 Coolidge Ave., Three Rivers, Mich.

CORRECTION

In the Blue Book's November Directory Issue the products of several manufacturers were unfortunately overlooked. To set the record straight we list, with due apology, the manufacturers and their products:

Riveting Machines:

Chicago Rivet & Machine Co.
9610 W. Jackson Blvd.
Bellwood, Ill.

Steel Stamps:

New Method Steel Stamps, Inc.
147 Jos. Campau
Detroit 7, Mich.

Cut-off machines: abrasive

Sawing Machines: contour

Saws: metal cutting

Sawing machines: band

Saw Guides: band

The Tannewitz Works
Grand Rapids, Mich.

Honing Tools and Fixtures

Wrenches: torque

Sunnen Products Co.
7910 Manchester Ave.
St. Louis, Mo.

Keyway Cutters:

Cutters: keyseaters
The du Mont Corp.

Greenfield, Mass.

Pulleys: friction clutch

The Conway Clutch Co.
2745 Colerain Ave.
Cincinnati 25, O.

Milling Machines: horizontal universal

Milling Machines: knee type

The Kempsmith Machine Co.
Milwaukee 4, Wis.

Arbors:

Grinders: profile

Grinders: tool & cutter

Milling Machines: knee type

Milling Machines: vertical

Tables: rotary

The Cincinnati Milling Mach. Co.
Cincinnati 9, O.

Grinders: roll

Lapping Machines

Cincinnati Grinders, Inc.
Cincinnati 9, O.

Pliers

Screw Drivers

Tin Snips

Punches

Chisels

Crescent Tool Co.
Jamestown, N. Y.

START THE BALL ROLLING-

*for a Better
More Profitable*

1950

Order Your
DETROIT POWER SCREWDRIVER
NOW!

MODEL A
For driving small
screws in delicate
assemblies. Capacity,
No. 2 to No. 6 screws.
Bench and pedestal
types.

ALSO 2
OTHER
MODELS



Let us show you how this modern machine will greatly speed your assembly work, raise production and cut costs . . . Hopper-fed Detroit Power Screwdrivers will drive all types of screws at amazing speed, as fast as one a second . . . Think what a tremendous time and labor saver! . . . All screws driven to uniform tension . . . No marring of heads or stripping threads.

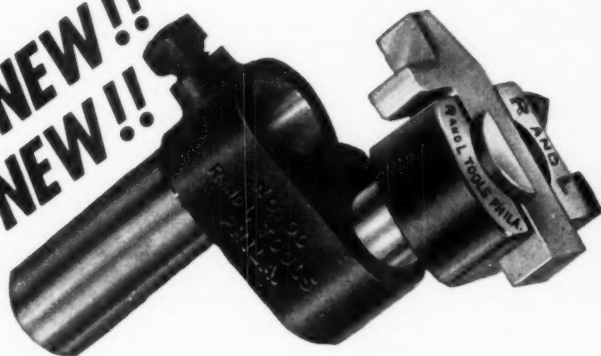
Let's get started Now for 1950

NO WAITING, NO DELAY...Delivery within 10 days on certain models

DETROIT POWER SCREWDRIVER CO.

2809 W. FORT ST.
DETROIT 16, MICH.

**NEW!!
NEW!!**



**R AND L
TURRET
BACK REST
HOLDER**

For use on R and L Turning Tools.
Simple design allows for convenient
interchanging of the R and L car-
bide surfaced or Roller Backrest
(above) and the R and L Burnish-
ing Backrest shown below. Built in
sizes to fit all R and L Turning Tools.

R and L Tools Changed in Ten
Seconds for Right or Left Hand
Turning.

Manufacturers of Precision Tools
for Screw Machines.

Also Turning Tools . . . Roller
Backrests . . . Carbide Backrests
. . . Tap and Die Holders . . .
Universal Tool Posts.



This
**TURNING
TOOL...
Replaces
14 TOOLS**

Can be changed from
RIGHT to LEFT
. . . in 10 Seconds

Write for Literature

R AND L TOOLS

1825 BRISTOL ST., NICETOWN, PHILADELPHIA 40, PA.

News of the industry.....

American Industry Not Strong . . . Recovery Program Advocated

Charging that American industry is not as strong relatively as it was before the war, an American Recovery Program was advocated today by Mr. A. G. Bryant, chairman of the Government Relations Committee of the National Machine Tool Builders' Association, at the Association's 48th Annual Meeting at White Sulphur Springs, Nov. 18.

Mr. Bryant, who is vice president of The Cleereman Machine Tool Co., and president of The Bryant Machinery & Engineering Co., asserted that our industrial plant has stagnated since the end of the war and that the "creeping paralysis of inefficiency eventually will lead to the undermining of our standard of living."

"Government policies," Bryant said, "including especially the Internal Revenue Bureau's archaic regulations on depreciation of capital equipment, have

slowed down the progress of modernizing American industry. While Russia is busily copying the latest American machine tools and Britain's socialist government is desperately offering incentives to private concerns to modernize, our government puts a penalty on the introduction of more efficient machinery."

Bryant proposed an American Re-



Top, left to right:

R. W. Glasner

David Ayr

Bottom, left to right:

J. A. Roterman

F. S. Blackall, Jr.

R. E. LeBlond



covery Program based upon the following three points:

1. Guide every step of our foreign policy along roads that will require our aid to be used in the establishment abroad only of those industries that will utilize available local resources to best advantage and will not merely duplicate facilities that already exist in this country and are ample to supply world requirements.
2. Stimulate the rehabilitation of the American industrial plant, which, although the best in the world, has been allowed to deteriorate by failing to replace its outmoded pre-war machinery with post-war designs.
3. Substitute in Government a constructive attitude of reassurance to industry that efficiency and well-earned profits are to be encouraged, in place of current policies which penalize progressive management and cast uncertainties in the path of venture capital.

HIGH COST OF FAILURE TO MODERNIZE

The failure of British industry to modernize plant and equipment fast enough to keep pace with public demand for social progress paved the way for the triumph of State Socialism in England. Dr. Cornelis W. de Kiewiet, President of Cornell University, told members of the N.M.T.B.A. at the annual dinner of the 48th Annual Meeting.

"British industrialists," Dr. de Kiewiet said, "took their profits out in social distinction instead of plowing them back into their business for the purchase of modern, productive equipment that would lower costs, increase markets and raise industrial efficiency and the standard of living.

"The world needs new tools, more experts, more know-how. Progress of the modern world demands the removal of ignorance, under-equipment, and want. Mechanization is an indispensable factor in solving many of the world's ills. This means that a prosperous and aggressive American industrial order is as necessary as a sound American foreign policy. American security and leadership are bound up

with a form of Government that guarantees incentives for modernization and profits for enterprise, since profits through reinvestment are the lifeblood of industry.

"Historically, active individual creative effort is necessary to provide society the full benefits of research and invention. Such creative effort is stifled under a regimented economy which reaches finally the inevitable result of stagnation of productivity and self-perpetuation of bureaucracy.

"As an example, unless India achieves advancement in mechanization under some measure of a free economy it will continue to exist on the knife edge between mere survival and complete disaster.

"Social progress is, after all, a reflection of work performed. Machines multiply man's capacity to turn out work, but also involved is man's willingness to work. Willingness depends upon potential awards—and awards can be offered only in a free society. If we expect, in this or any other country, to gain the benefits of technological advances, we must preserve the human willingness and desire to put those advances into practical application," he said.

UNIONS AND TREASURY DEPARTMENT HAMPER INDUSTRIAL DEVELOPMENT

At the same 48th N.M.T.B.A. meeting it was charged by Mr. Lloyd D. McDonald, that union restrictions upon production are levying a bill of millions of dollars upon the American public.

Mr. McDonald is vice president of the Warner & Swasey Co., Cleveland, O.

"Today" McDonald said, "we see the amazing spectacle of machine tool operators, under leadership of union stewards, holding down the output of new machines to a mere fraction of the productivity that has been built into them.

"The result of such limitations on output is that the general public is not getting the benefit of the advances in machine tool design. People today are paying more for many of the things they buy than they ought to be paying in view of methods now in hand of producing them faster and cheaper.

"One would think that sooner or later the union men who are preaching the philosophy of fear of the new machine would realize they are defeating their own objectives, for limitations on productivity lead either to inflation or unemployment."

Pointing out that although all industry knows that the basic answer to our social and economic progress is greater productivity, the metalworking plants of the country are still chiefly equipped with machine tools of war vintage designs of which were frozen in 1940, McDonald cited three barriers to the purchase of modern and far more productive machines:

1. Section 102 of the Internal Revenue code, which makes a company hesitate to build up reserves for equipment replacement for fear it may suffer a tax penalty upon the charge of improper accumulation of surplus.
2. The system of double taxation of earnings, whereby the total profits of the corporation are taxed first, and then stockholders are taxed on such dividends as are paid

out of the remainder.

3. The present policy of the Internal Revenue Department with respect to depreciation schedules.

"As matters stand today," McDonald said, "it is impossible for a company to gain out of depreciation allowances the funds sufficient for replacement. Part of this is due to inflation—but it would be true if there were no inflation. The facts show in our industry that on the average, owing to our rate of improvement, a machine tool model is rendered obsolete within about 7 years after its introduction; and certainly I doubt whether most companies in doing replacement arithmetic reckon the anticipated profitable life a new machine at more than 10 years. But Government, in most cases, insists upon depreciation over at least a 20-year period. Half of the funds needed for replacement, therefore, can come only out of earnings after taxes. It is this factor which, in my opinion, is the primary brake upon replacement today."

Sheer economic necessity, McDonald predicted, will dictate an upturn in machine tool sales.

NEW N.M.T.B.A. OFFICERS ELECTED

David Ayr, president and general manager of the Hendey Machine Co., Torrington, Conn., is the new president of The National Machine Tool Builders' Association, following his election at its 48th Annual Meeting at White Sulphur Springs.

Richard E. LeBlond, president of The R. K. LeBlond Machine Tool Co., Cincinnati, O., and **Frederick S. Blackall, Jr.**, president of The Taft-Peirce Mfg. Co., Woonsocket, R. I., were elected first and second vice presidents, respectively.

Jerome A. Raterman, president of The Monarch Machine Tool Co., Sidney, O., was elected treasurer. **Tell Berna** continues as general manager and **Mrs. Frida F. Selbert** was again named secretary.

Three new directors were also elected. They are **Mr. Blackall**, **Mr. Raterman** and **Mr. R. W. Glasner**, president of the Clearing Machine Corporation, Chicago, Ill. They will serve three year terms.

Mr. Ayr, who took office as president at the conclusion of the Annual Meeting, received his early training at Brown & Sharpe Mfg. Co., Providence, R. I. Later he was associated with the Pierce-Arrow Motor Car Co., at Buffalo, and in 1924, with the Pratt and Whitney Division of Niles-Bement-Pond Co., as works manager.

He was elected president and general manager of The Hendey Machine Co., in 1932, which position he now holds.

Answers to Quiz On Page 121 Name The Machine Part

5. Cut off tool holder
6. Circular form tool holder
8. Knew turner
9. Roller rest
2. Double decker vertical or dovetail tool holder
4. Flat form tool holder
1. Double knurling tool holder
3. Block type tool holder
10. Roller rest turner
7. Double decker cut off tool holder

Chicago DIE CASTINGS

AVAILABLE from STOCK
for IMMEDIATE SHIPMENT

"Y" Pulleys



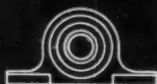
"Step" Pulleys



"Multiple" Pulleys



"Variable" Pulleys



"Ball Bearing" Pillow Blocks



"Bronze Bearing" Pillow Blocks



"Babbitt Bearing" Pillow Blocks



"Babbitt" Journal Bearings

Yes!—all items illustrated on this page, and many other items not illustrated, are Standard Stock ready for immediate shipment to you. **YOU SAVE—TIME . . . MONEY . . .** when you use Chicago Stock Parts. No dies to build . . . No stock to carry.

For complete information
write for catalog No. 50A



Shaft
Collars



Flexible
Couplings



Miter
Gears



Hand
Wheels



Manufactured by
Chicago DIE CASTING MFG. CO.

2515-17 West Monroe Street
Chicago 12, Illinois



American Machine and Foundry Company's purchase of all the properties and assets of DeWalt, Inc., Lancaster, Pa. manufacturer of radial saws for high-speed cutting of wood, light metals and plastics, was consummated today, according to an announcement by Moorehead Patterson, AMF board chairman.

The closing involved the transfer of 115,000 shares of American Machine and Foundry Company common stock plus \$655,000 in cash to DeWalt, Inc. DeWalt shareholders had indicated their approval of the sale. DeWalt's current assets as of September 30, amounted to \$1,751,447

including more than \$1,000,000 in cash, as against current liabilities of \$198,531.

Mr. Patterson said AMF will continue operation of the 75,000 square foot DeWalt plant, located on a 10-acre tract, at Lancaster with the present personnel through a wholly-owned subsidiary.

First United States International Trade Fair. Prominent national leaders in the Machinery industry are participating in the First United States International Trade Fair, a giant trade show patterned after the world-famous Leipzig and Antwerp fairs, which will be held in Chicago August 7 to 19, 1950.

One million square feet in Chicago's largest exhibition halls will house the Fair, which will be the most tremendous trade exhibition ever held in the Western Hemisphere.

A complete array of highly saleable products made by manufacturers in

the United States and abroad will be on display, classified under 29 trade categories, including both consumer and industrial commodities.

Reaction from American and foreign business interests has been highly enthusiastic, according to Fair officials who report that buyers and exhibitors from all over the world are already writing for reservations.

Space renting at three dollars per square foot for the two week period is being leased rapidly, and communication with buyer groups indicate a record-breaking attendance.

Emboss Your Own Metal Tags

At Low Cost



**Get a Completely
Embossed Tag Every 1½ Seconds!**

You can emboss up to 20 characters at a time on 50 metal tags per minute with this efficient, easily-operated Pannier "Master Marker." Characters are carried on interchangeable slides; positioned by hand wheels on side of machine head. Die slides are engraved to specification, including standard code characters of the Concrete Reinforcing Steel Institute. Tags are supplied in reels; mount on machine for safe, convenient feeding. Machine is available with foot or power operation.

GET COMPLETE DATA FREE

Complete data on this and other efficient Pannier "Master Marker" Embossing Machines is available on request. Ask for Bulletin D-9.

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Youngstown, O.

Chicago, Ill.
Philadelphia, Pa.

Los Angeles, Calif.
Jacksonville, Fla.



THE PANNIER CORPORATION

203 Pannier Building

Pittsburgh 12, Pa.

The Rockwell Mfg. Co. has acquired the automatic air hydraulic drill head formerly manufactured by the Cleveland Republic Tool Corp. This is an addition to their line of Delta-Milwaukee power tools. This acquisition was announced by H. Campbell Stuckeman, Rockwell vice president and general manager of the Delta Mfg. Div. Three different models of the unit will be manufactured: No. 2—1½ h.p., Max. 1½" stroke; No. 3—1½ h.p., Max. 4" stroke; No. 5—5 h.p., Max. 6" stroke. These models will be offered with direct motor drive; in combination with gear reduction drives, and also a simple pulley drive.

Mr. Stuckeman described this tool as one of the most versatile metal working drill heads on the market. He explained that it is primarily a production tool, which can operate in any position. Many users have capitalized on its extreme flexibility by designing special set-ups in which the Cleveland Republic drill heads are used either singly or in multiples operating simultaneously.

"Design features make this completely self-contained drill unit a dependable production tool for precision work," Mr. Stuckeman continues. "A rugged quill with ball bearing mounted spindle travels to provide the stroke, eliminating distortion of holes and whipping of drills.

"Air hydraulic power provides controlled positive feed at all times. A patented rapid approach which is adjustable brings the drill up to the work without striking the drill point against the work.

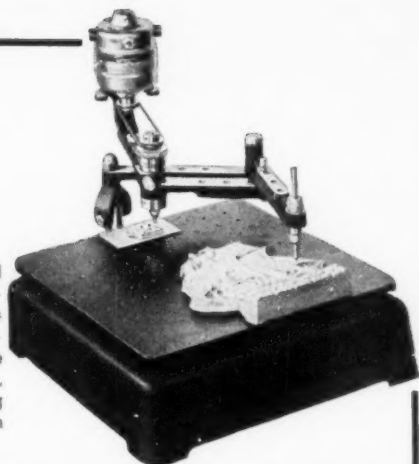
"Micrometer adjustment on spindle-travel controls depth of feed stroke within .001".

Logan Engineering Co. announces completion of details involved in merging the Dor-O-Matic Company into the Logan organization. While full terms of the merger have not been made public, it is announced that manufacture of the Dor-O-Matic Door Control has been transferred from the Dor-O-Matic factory at 818 S. Kolmar Avenue, Chicago, to the recently enlarged, modern Logan Engineering plant at 4901 West Lawrence Ave., Chicago. A Dor-O-Matic division

MICO

2 and 3-Dimensional ENGRAVER

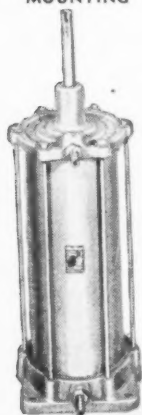
• NOW you can do three-dimensional milling by tracing shape of enlarged master with stylus. The 252 Engraver fills the need for a portable, inexpensive, dependable and accurate machine to make small dies and molds for plastics, rubber, glass, or die castings, and other forming operations. Master can be reproduced in any of four reduction ratios.



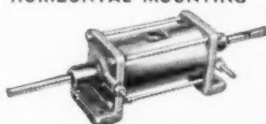
Improved partograph design simplifies conventional engraving of templates, nameplates, panels, trademarks and machined parts.
Write for 8-page illustrated folder which gives complete details.

MICO INSTRUMENT CO. 78 TROWBRIDGE ST.
CAMBRIDGE, MASS.

VERTICAL
MOUNTING



HORIZONTAL MOUNTING



FACE
MOUNTED
CYLINDER

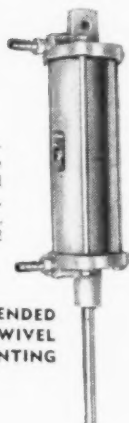


DOUBLE- ACTION AIR CYLINDERS

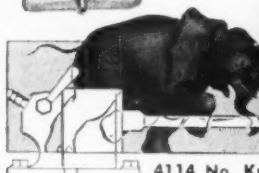
Mounting	Bore				
Horizontal	1 1/2"	2 1/4"	3"	4"	5"
Vertical	2 1/4"	3"	4"	5"	
Face	2 1/4"	3"	4"	5"	
Swivel	2 1/4"	3"	4"	5"	

Length of stroke optional

The new Mead Air Power Catalog shows the full line of single and double-acting cylinders, and air-operated Presses, Vises, Chucks, Hammers, Work Feeders—for faster, money-saving production. Write!



SUSPENDED
OR SWIVEL
MOUNTING



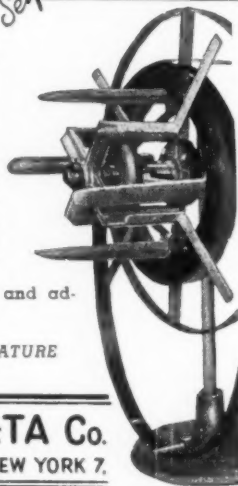
MEAD
SPECIALTIES COMPANY

4114 No. Knox Avenue, Dept. YA-10 Chicago 41, Ill.

WESTLEN REELS

*Adjustable
Self Centering*

For feeding strip and wire coil stock to presses. Coil capacity 300 to 500 lbs. Outside ring dia., 28" to 36". Height of reel, 36". Wheel automatically adjusts parts to suit inside diameter of coils from 11" to 20". Arm allows for quick conversion to horizontal or vertical position and adjusts height of reel.



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The RULETA Co.
27 WARREN ST. NEW YORK 7.

OUR EFFICIENT TOOL DESIGNING

*means
better production
at a lower cost*

Efficient tool designing in post-war's competitive production is a "must". Our experience guarantees you tools — designed for economy of operation, resulting in your increased production at lower costs.

COLUMBUS DIE TOOL
and Machine Co.

930 CLEVELAND AVE., COLUMBUS 1 OHIO

has been set up within the Logan organization to handle production and distribution of the line of door checks on a nation-wide basis. The new division is operating under the direction of the Logan staff. In addition to the activities of its new Dor-O-Matic Door Control Division, Logan Engineering will continue the manufacture of the Logan Lathes at the Lawrence Avenue plant.

The assets of The O. K. Tool Co., Shelton, Conn., manufacturers of single point and inserted blade type milling cutters, have been acquired by **Williams & Hussey Machine Co.**, Wilton, N. H., manufacturers of special machinery and "Star" gages, known to the trade since 1883. The O. K. Tool sales staff and executive personnel remains intact. Alfred L. Marshall continues as general manager of The O. K. Tool Co. which will operate as a division of the parent company.

John A. Silver, formerly vice-president in charge of export and domestic sales for the F. J. Stokes Machine Company, manufacturers of pharmaceutical and plastic moulding equipment, **Bernard Lester** and **Frank W. Hankins** have announced the formation of the management engineering firm of Lester, Hankins and Silver.

FOR *Precision* SET-UPS



It's much easier to make precision set-ups for tapping and reaming if you use a Ziegler Tool Holder. Why? Because the Ziegler compensates for inaccuracies of as much as 1/32" radius or 1/16" diameter.

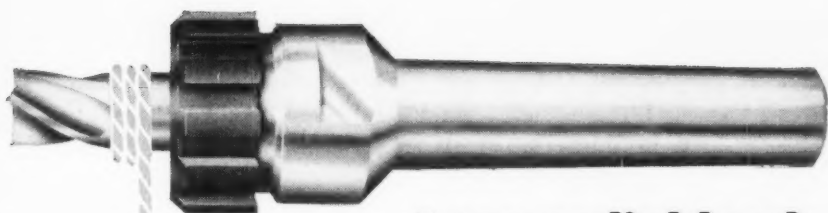
Simplify your set-up jobs by using Ziegler Floating Tool Holders. They're tops for precision.

W. M. ZIEGLER TOOL CO.
13570 Auburn, Detroit 23, Mich.

Ziegler
ROLLER
DRIVE

WRITE FOR
CATALOG

FLOATING HOLDER
for Taps and Reamers...



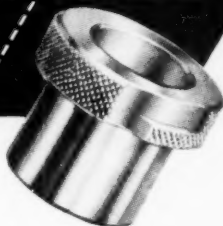
**1 ton radial loads
can't budge tools
gripped in UNIVERSAL
COLLET CHUCKS**

**UNIVERSAL ENGINEERING CO.
FRANKENMUTH, MICHIGAN**



IMMEDIATE DELIVERY!

American **DRILL JIG
BUSHINGS**



EXCLUSIVE DISTRIBUTORS IN EVERY MAJOR LOCATION
THROUGHOUT THE U.S. AND CANADA CARRY ALL SIZES IN
STOCK FOR IMMEDIATE FREE DELIVERY. YOU ARE ASSURED OF
QUALITY - SERVICE - IMMEDIATE DELIVERY

SEND FOR CATALOG

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CO., INC.

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SPECIALIZING ONLY IN DRILL BUSHINGS



Appointments & Promotions

Two recent executive appointments are announced by the Rockwell Manufacturing Co.'s Power Tool Division, Milwaukee, Wis. **Irving G. Meyer** has been named consumer sales manager and **John Stolarz**, manager of Multiplex sales.



John Stolarz



Irving G. Meyer

J. C. Stites has been appointed assistant manager of sales and export sales manager of The Cleveland Twist Drill Co. **R. O. Artner**, formerly manager of The Cleveland Twist Drill Company Detroit Stockroom, was promoted to the Field Sales Division.

Philip B. Niles has been elected a vice president of The Yale & Towne Manufacturing Co., it was announced by Gilbert W. Chapman, president.

Robert W. Wolcott, president of Lukens Steel Company, was named chairman of the board and **Charles Lukens Huston, Jr.**, vice president and executive assistant to the president was elected president of the company, by recent action of the Board of Directors at its recent meeting in Coatesville, Pa.



Charles Lukens Huston, Jr.



Paul M. Arnall

The Lunkenheimer Company, Cincinnati, announces the appointment of **Paul M. Arnall** as vice president and general manager.

John A. Proven has been appointed vice president in charge of sales of the Porter-Cable Machine Co., Syracuse, N.Y., **DeAlton J. Ridings**, president of the firm announced.

C. Neil Norgren, assistant general manager of the C. A. Norgren Co., Denver, has been elected to the Board of Directors of the Manufacturers' Association of Colorado.

Harry C. Gross has been appointed chief chemist and metallurgist by Tungsten Alloy Manufacturing Company, Inc., Newark, N. J., it was announced by **Clermont Cartwright**, president.

'STAR DUST'

LABORATORY GRADED PURE DIAMOND POWDERS

For GAUGES, TOOLS, DIES, etc., with tremendous TIME SAVING. These factors make STAR DUST indispensable in lapping and superfinishing on HARDSTEELS, TUNGSTEN CARBIDE, CHROME.

- Absolute control of particle sizes
- Complete absence of out-size particles
- STAR DUST sizes as fine as .0001"
- Complete range of grit sizes

There is a STAR DUST Field Serviceman in your territory.

ACE ABRASIVE LABORATORIES

1 SPRUCE ST.
NEW YORK 7, N.Y.

STAR DUST speeds up production enormously and produces finishes and superfinishes down to less than .0000004 of an inch.

**Precision LAPPING
POWDERS for
PRECISION work**



The Pope Machinery Corporation, Haverhill, Mass., has recently named **Arthur J. Renz** as field engineer on precision spindle applications.



Arthur J. Renz



Edward H. Roos

Edward H. Roos has been appointed factory manager of the C. A. Norgren Co., Denver, Colo., according to an announcement of Carl A. Norgren, president.

Homer A. Goddard, Jr., has been named assistant general manager for industrial marketing for Gulf Oil Corporation, Pittsburgh, Pa. H. G. Meador, vice president of divisional sales has announced.

Iron and Steel Products, Inc., Chicago, announces the appointment of **J. J. Collins** to the position of general manager.

Max L. Murdock has been promoted to manager of the Centrifugal Pump department of Allis Chalmers Norwood (Ohio) Works, succeeding H. C. Gaton, retired, according to an announcement by J. D. Greensward, general manager of the works. **Woodrow Brixius** has been named assistant to Murdock, and **Paul B. Hugenberg** has been appointed application engineer in charge of sales and orders.

John L. Sinclair has been appointed Cleveland district manager of the Mechanical Goods division of the Goodyear Tire & Rubber Co.

Bernard E. Meyer has been named to succeed Frank Willmott, recently retired, as Chicago District sales manager of E. W. Bliss Co., Toledo.

The appointment of **N. L. Watkins** as chief development engineer of the Almco Division of Queen Stove Works, Inc., Albert Lea, Minn., has been announced by R. C. Trow, manager of the division.

Acme Offers Complete Facilities for All Types of

PRECISION GRINDING

FAST SERVICE...EXPERT WORKMANSHIP...LOW COST

- INTERNAL
- EXTERNAL
- CRUSH FORM
- CENTERLESS
- TWIN DISC
- SURFACE
- THREAD



Acme is equipped to handle all types of precision grinding. Expert craftsmen, using newest methods and modern equipment, will do the job for you faster, better, more economically. Acme also offers a flat lapping service that can finish surfaces to within millionths. Write for details.

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Makers of Standardized Jig & Fixture Bushings
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THE SERVICE SHOP TO INDUSTRY FOR MORE THAN 25 YEARS

Reduce

Use

OPERATING COSTS



Anti-Scoring LUBRICANT

Non-corrosive and highly concentrated to withstand pressures greater than 50,000 lbs. per square inch, CMD gives your tools the best anti-scoring protection available! Safe, sure, and economical, CMD prevents any metal-to-metal contact—no ruined work and costly delays. Write today for **FREE SAMPLES and catalog.** Address Dept. 1B.



Available as oil or grease. Packed in 4 oz. tubes, 1 and 5 gallon cans, and 55 gallon drums.

CHICAGO MANUFACTURING & DISTRIBUTING CO.

1928 WEST 46th STREET CHICAGO 9, ILLINOIS

The Martin Machine Company, Kewanee, Ill., has announced the appointment of **James M. Arroyo** to the position of company sales manager.

Duro Metal Products Co., Chicago, announces the recent appointment of **C. E. "Ed" Brady** as general sales manager of its Power Tool Division.



C. E. "Ed" Brady



Isham Keith

Announcement is made of the appointment of **Isham Keith** as machinery manager of the New York branch office of Pratt & Whitney, Division Niles-Bement-Pond Company.

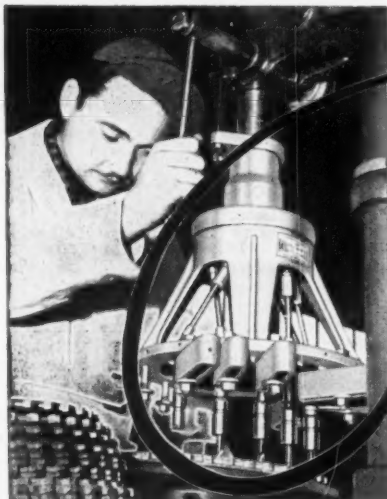
Appointment of **Walter A. Kesterke** as sales representative for industrial grinding wheels in Wisconsin and southwest Michigan, has been announced by **J. A. Fairfield**, manager of grinding wheel sales, United States Rubber Co., Fort Wayne, Ind.

The Carpenter Steel Co., Reading, Pa., announces the appointment of **Omar V. Greene** as New England sales manager with headquarters in Hartford, Conn., to succeed **Wynn F. Rossiter**, who has been made assistant to the vice president to devote his time to special work. **John W. Thompson** has been named manager of sales development to succeed Greene in this capacity at the company's main office.

Marvin W. Smith, president of the Baldwin Locomotive Works, has been elected a director of the Westinghouse Electric Corporation, according to an announcement made by **Gwilyn A. Price**, president of Westinghouse.

Harry J. Deines of New York has been named manager of advertising and sales promotion for the Westinghouse Electric Corporation, Pittsburgh, Pa., it was announced by **J. H. Jewell**, vice president in charge of sales.

MULTIPLE DRILLING with a . . .



MULTI-DRILL

**Increases Capacity
Up to 800%**

**ADJUSTABLE TO ANY HOLE PATTERN
FITS ANY DRILL PRESS**

If your production requires drilling from 2 to 8 holes in a work piece, a MULTI-DRILL will cut costs and speed output up to 800%. The MULTI-DRILL is universally adjustable to any hole pattern — is compactly built to permit easy, unhampered operation with drill jigs or other special fixtures. Ruggedly built to take the wear and tear of high production work, the MULTI-DRILL will handle your long and short run multiple drilling jobs with ease and economy. The MULTI-DRILL will drill on hole centers as close as $\frac{1}{8}$ " — handle drill sizes up to $\frac{1}{2}$ " in steel. Special adaptations available.

There is a Commander MULTI-DRILL Distributor in your area. Write for his name, literature and complete details.

COMMANDER MFG. CO.

4227 West Kinzie St.

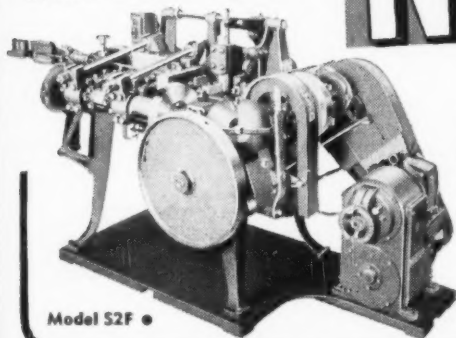
Chicago 24, Illinois

Product of Commander — Builder of the Commander Tapper

There's Nothing like a

NILSON

For
Rapid Production



Model S2F •

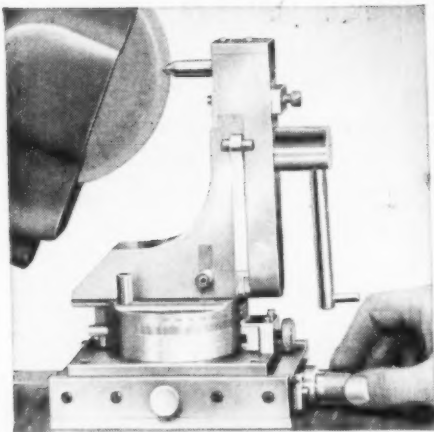
• **Combination Press and
4-Slide Forming Machine**

Extra rigid construction; tooling costs are generally lower; forming tools are interchangeable and easy to adjust. Send for catalog.

A. H. NILSON MACHINE CO.
BRIDGEPORT 5, CONN.

Automatic Wire and Metal Forming Machines • Staple Forming Machines • Chain Making Machinery • Foot and Power Presses • Wire Reels • Wire Straighteners.

SPECIALISTS IN WIRE FORMING EQUIPMENT FOR OVER 50 YEARS



Fluidmotion * accurate form-dressing even by a beginner

Two angles and a radius can be dressed in one continuous motion.

- Precise, sharp contours are obtainable consistently to .0001" accuracy.
- Simple, rapid operation.
- Micrometer feed to wheel.
- Capacity to 14" wheel.
- Dust protected.
- Special fixtures for T slot machines.
- 180° radius attachment.

Also manufacturers of

FORM-MASTER WHEEL DRESSER

Lower-priced—Accurate to .0002"

Capacity to 10" wheel
Dust proof. Price \$150.00.

Precision form tool grinding on high speed steel and carbides

Write for Literature

*Reg. U. S. Pat. Off.



The Kase Machine Company, Cleveland, has announced the appointment of **Ralph M. Whitaker** as the Ohio district sales manager for the complete line of Glenny push-broaches.

Victor Ladetto, sales manager of Continental Screw Co., New Bedford, Mass., recently announced three changes in the company's sales force: **Leonard A. Ashworth** will represent Continental in Maine, New Hampshire, Vermont and Connecticut. **Robert A. McCormick** will take over the New York Metropolitan area. **Paul R. Flemming** is covering the state of New York and a portion of Pennsylvania.

Cummins Business Machines Corporation, Chicago, announces the election of **Otto Doerner**, as vice president in charge of manufacturing and engineering.



Otto Doerner



Chester M. MacChesney

• • •

Carl J. Sharp, president, has just announced that the board of directors of Acme Steel Co., Chicago, has elected **Chester M. MacChesney** as chairman of the board, to fill the vacancy caused by the sudden recent passing of Charles S. Traer.

The appointment of **Stephen F. Curtis** as director of purchasing for Johns-Manville Corporation, New York, was announced December 1 by A. R. Fisher, vice president for production.

Frank D. Mumford has been appointed parts sales manager of E. W. Bliss Co., Toledo.

A. A. Johnson has recently been appointed manager of Central Station Engineering in the Industry Engineering Department of the Westinghouse Electric Corporation, succeeding **Dr. Charles F. Wagner**, new Consulting Engineer for the Company.

Dr. Charles F. Wagner has recently been appointed consulting engineer for the Westinghouse Electric Corporation in the central station and power fields.

The appointment of J. L. Cross as manager of Power Transformer sales for the Westinghouse Transformer Division at Sharon, Pa., is announced. He succeeds C. H. Bartlett, recently made sales manager for the entire Transformer Division.

Thomas A. Daly has been appointed engineering manager in charge of all naval ordinance work of Westinghouse Electric Corporation at Sharon, Pa.

Stockholders of Detrex Corporation, Detroit 32, Mich., have elected Robert Lindley Murray as a director of the corporation.

Mathews Dick, Jr., has been recently appointed sales engineer, in the Chicago area, by the Butterfield Division of Union Twist Drill Co., Derby Line, Vt.

Harry L. Bialock, manager of sales of National Tube Co., Atlanta, Ga., has been promoted to manager of sales of the tubing specialties division of this U. S. Steel subsidiary, the company has announced. He will make his headquarters at Gary, Ind. Charles J. Lundvall has been appointed manager of sales at Atlanta to succeed Bialock.

Die-Mold Corporation, Milwaukee designers and builders of plastic molds, have appointed Adolph D. Mandl as manager of their plant. Sig Mandl continues as vice president and general manager.

Joseph P. Crosby, vice-president in charge of sales of The Lapointe Machine Tool Co., Hudson, Mass., has announced the opening of the firm's Chicago offices at 2400 W. Madison St., regional headquarters for Lapointe sales and service engineers, three of whom, James W. Dopp, George A. Hodges, Jr., and Richard S. Davis, are already appointed.

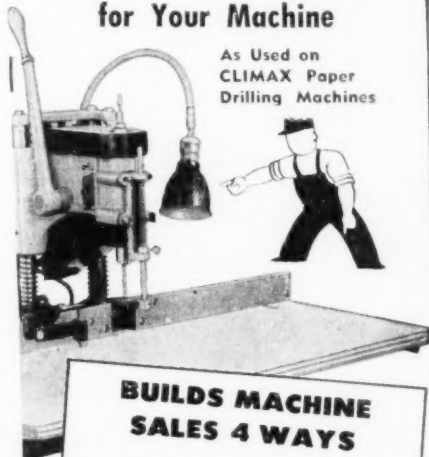
Appointment of John E. Payne as manager of the Westinghouse Electric Corporation's Central District has been announced. He will supervise the Westinghouse apparatus business in the Pittsburgh, Cleveland, Detroit, and Cincinnati areas, and will make his headquarters in Pittsburgh.

Make

VIMCO *Light*

a New Selling Feature
for Your Machine

As Used on
CLIMAX Paper
Drilling Machines



**BUILDS MACHINE
SALES 4 WAYS**

- ✓ Increased Production
- ✓ Greater Safety
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VIMCO FEATURES

- ✓ Easy to Mount
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- ✓ Flexible Arm
(oilproofing available)
- ✓ Any Size or Style

WRITE FOR FOLDER 74

VIMCO *Light*

Since 1920
Made by

VIMCO MFG. COMPANY, Inc.
109 Brayton St. Buffalo 13, N.Y.

Dealers & Distributors

Butterfield Division of Union Twist Drill Co., Derby Line, Vt., manufacturers of industrial cutting tools, announces the appointment of **F. P. Rogers**, 520 First Ave., S. Seattle, Wash., as their representative in Oregon and Washington.

Ellis W. Akin has been appointed authorized representative of the C. A. Norgren Co., Denver, with headquarters in Kansas City, according to an announcement by Jack M. Evans, sales manager. The area served by Mr. Akin includes Western Missouri and Eastern Kansas from Springfield to Wichita.

The A. F. Holden Company of New Haven, Conn., and Detroit 16, Mich., announces the appointment as West Coast representative of **Lloyd J. Bohan**.

The Butterfield Division of Union Twist Drill Co., Derby Line, Vt., has appointed **Sminkey and Haas**, 2421 W. Pratt Ave., Chicago, Ill., as a distributor.

The Ready Tool Co., Bridgeport, Conn., announces the appointment of **Raymond C. Stoelting**, Indianapolis, to handle the Red-E line in the state of Indiana.

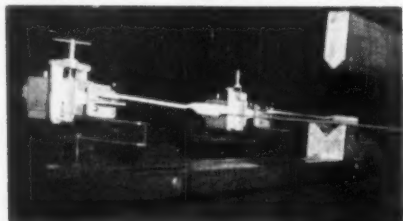
The following have been appointed exclusive representatives for Hydro-Line Air and Hydraulic Cylinders and Special Machinery: **Austin-Hastings Co., Inc.**, Cambridge, Mass., for the New England states excluding Connecticut; **Hydro Pneumatics, Inc.**, New York, N. Y., for Metropolitan New York and northern New Jersey.

Hauser Machine Tool Corp., Manhasset, N. Y., has been appointed exclusive United States factory representative for S. Lambert, S. A., Solothurn (Soleure) Switzerland.

Paul E. Lee, manager of Arrow Sales Company, Tulsa, Okla., has been named representative of the C. A. Norgren Co., according to J. M. Evans, sales manager of the Denver concern.

The Mule Gauge

ELIMINATES CREEPING - SLIPPING



This sturdy gauge is constructed to withstand the continual jars and jolts of cutting, punching and bending of heavy iron, without moving from a set dimension.

Adjustable to 128 and adaptable to saws, punches, shears, brakes, cutters and many other type machines. Fits 1½ or 2" Tee gauge bar. Increases accuracy and reduces set-up time.

Write for illustrated folder giving complete details.

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E. W. Bliss Company, Toledo, announces the following sales representatives: **Stedfast & Roulston, Inc.**, Boston, Mass., for the states of Maine, New Hampshire, Vermont, Rhode Island and the eastern sections of Connecticut and Massachusetts; **Lakeshore Machinery & Supply Co.**, Muskegon, Mich., for western Michigan; **Wm. S. Bolden Co., Inc.**, Charleston, W. Va., for the state of West Virginia; **Corry's Machine & Tool, Inc.**, Davenport, Iowa, for Iowa and part of Illinois; **Ellfeldt Machinery & Supply Co.**, Kansas City, Mo., for eastern Kansas and western Missouri.

F. H. Harris Co., Worcester 8, Mass., has been appointed New England service and sales representatives by Colonial Broach Co., Detroit 13, Mich., according to an announcement by Ralph G. Lagerfeldt, vice president in charge of sales.

F. H. Harris Co., Worcester 8, Mass., has been appointed service and sales representative by Michigan Tool Company, Detroit 12, Mich., according to an announcement by Paul F. Zerkle, sales manager.

The Milton A. Meier Company, 816 New Center Bldg., Detroit 2, Mich., has been appointed distributor for Reynolds aluminum pig and ingot products in the Detroit area, it was announced recently by David P. Reynolds, vice president and manager, General Sales Division, Reynolds Metals Co., Louisville, Ky.

Dr. Martin H. Heerin, former director of research for the Armour Research Foundation of the Illinois Institute of Technology, has been named director of applied research for the industrial products division of Elgin National Watch Company, Elgin, Ill.

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Determines spot temperatures of heat-treating furnaces, fire boxes, kilns and forgings accurately—**instantly**. No thermocouples, lead wires or accessories needed. Temperature is recorded on direct-reading dial at press of button. Two double ranges. Write for FREE Cat. No. 100.

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THE FACTS ABOUT THE "M-B"**

"JUNIOR" Pneumatic GRINDER

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Gas burner—385 holes drilled at one pass on 5/16" centers.

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**TOOLS FOR INDUSTRY
and SPECIAL MACHINERY**

PROPER FILE USE

Two factors necessary in accomplishing accurate filing are, first, the selection of the proper file, and, second, skillful use of the instrument. Although precision filing is an art, any person using the right tools, methods and care can quickly learn to produce masterful work.

There are three elementary ways in which a file can be put to work: (1) Straight filing, which consists of pushing the file lengthwise — straight ahead or slightly diagonally — across the work;

(2) Draw filing, which consists of grasping the file at each end and drawing it across the work; (3) Lathe filing, which is a stroking of the file against the work as it revolves in the lathe. In straight filing the handle of the file is grasped with the thumb resting along the line of the file. The other hand should hold the tip of the file firmly between the fingers and thumb. For the usual flat filing, the operator should aim to carry the file forward on an almost straight line — changing its course only enough to prevent grooving.

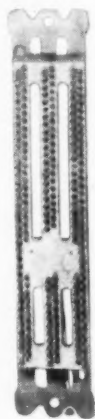
Draw filing consists of grasping the file firmly at each end and alternately pushing and pulling the file sideways across the work. Since files are primarily made to cut on a longitudinal forward stroke, a file with a short angle cut should never be used for draw filing because of the likelihood of scoring or scratching instead of shaving.

When properly done draw filing produces a somewhat finer finish than straight filing.

In lathe filing the file should not be rigid or stationary, but be stroked constantly. A slight gliding or lateral motion assists the file to clear itself of chips and avoids ridging or scoring.

The work to be filed should be placed at elbow height, or even higher for finer work. For work that is apt to be damaged, protectors (soft metal) should be placed between the work and the jaws of the vise.

Courtesy of Nicholson File Co.



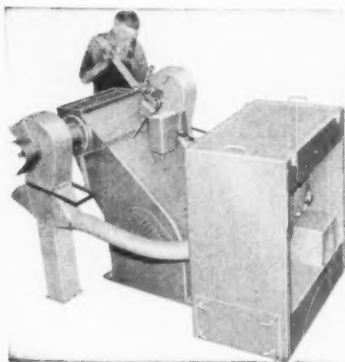
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Model 1150 — 1400 cfm — always the best choice for Hammond VRO Polisher.

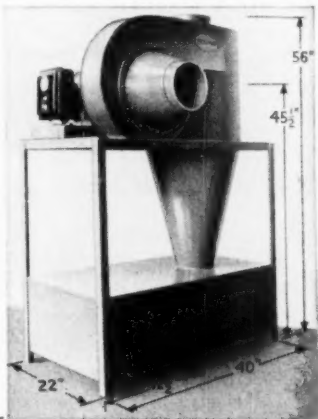
Model 20N30 — 2300 cfm — exhausts cleaned air outdoors.



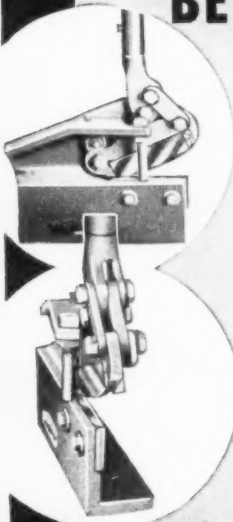
For recommendation by return mail, describe dust problem. No obligation. New Catalog 605 now ready.

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"S-3" Slitting Shears for slitting, cutting and trimming sheet steel or any other material, have compound power transmission, which provides smooth, easy operation. Interchangeable and adjustable blades of high quality tempered and drawn tool steel are firmly held in alignment by the rigid frame to assure clean cutting, regardless of the thickness of metal—up to capacity. Unique adjustable shoe, bearing on upper blade holder, provides additional support, for the upper blade, which increases the strength and cutting efficiency of the Shear.

Slitting capacity 1/8"; trimming 3/16";
bar capacity 1/4" x 2" (capacities given
are in mild steel)

Ask your Beverly Dealer for a demonstration or write for full details and illustrated circular.

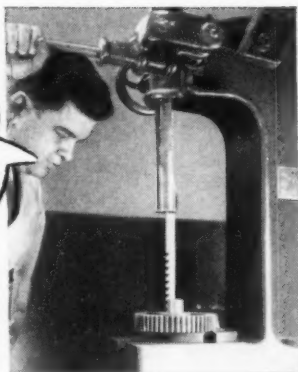
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Chrome Blades for cutting
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special order.



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A KEYWAY FOR
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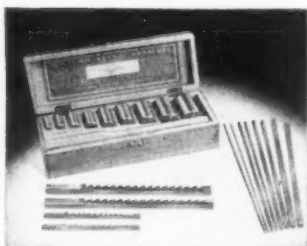
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With one *Minute Man* Broach and Bushing, costing only \$8.25, you can cut 100 keyways in gears, milling cutters, pulley hubs, collars, couplings, etc.



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**INCOME OF METALLURGISTS TOPS ALL
ENGINEERING GROUPS**

Metallurgy is the highest paid of the engineering professions. This fact was established as a result of a recent National survey, first of its kind, by the American Society for Metals. The survey, first of its kind ever made, also classified the professional metallurgist as to his title, class of work, responsibility over others, distribution of time, products made by his company, as well as salary bracket at different periods of employment.

Income: The average income for metallurgists, according to the ASM analysis, is \$6,567. The National average income for all types of engineering, according to the U. S. Bureau of Labor Statistics, is \$4,668. Comparisons with other professional incomes are equally impressive. The lawyer receives an average of \$5,719; the engineer's average is the chemical engineer's \$4,320. The average yearly income of all college graduates in the U. S. is \$4,689, while the average yearly pay of all U. S. workers is 2,840.

Three factors were shown to affect a metallurgist's income — his responsibility, his college or technical training, and the length of time on the job.

Aside from 65% of those queried who had succeeded to administrative and sales positions, the responsibility of metallurgical control over quality and production offered the highest income — a high

of \$35,000, with an average of \$7,221.

The second factor — that of technical training — shows that with a bachelor degree, the metallurgists income averaged \$6,601. A master's degree justified \$6,877. The metallurgist with a doctor's degree has an average yearly income of \$9,122.

The third influence came from experience or length of service. Metallurgists with one year out of college drew an average income of \$3,700. After five years on the job, the average went to \$5,500. Ten years experience advanced the income to an average of around \$6,500. Twenty years after graduation, the metallurgist was averaging \$8,100.

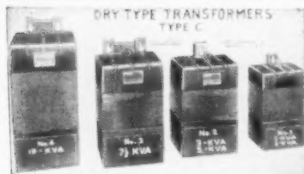
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For Every Class of Service
STANDARD AND SPECIAL



We manufacture all types of transformers, sizes from 1/4 to 500 KVA. Air, oil, or water cooled for distribution, lighting, welding, furnace, phase changing rectifiers, auto, etc.

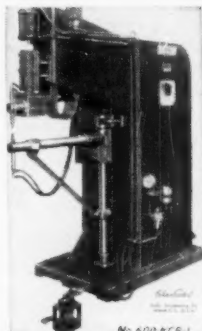
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For all types of welding in sizes: 1/4 to 300 KVA. Foot, air or motor operated.

We invite contract spot or butt welding in large or small quantities.



Air operated Press Type Spot Welders (made from 5 to 250 KVA)

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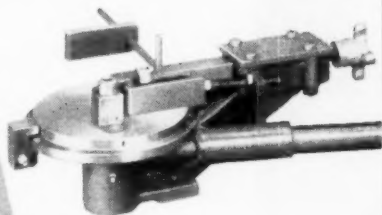
OVER 50 YEARS ★ THE BENDER PEOPLE

Wallace

NO. 10 UNIVERSAL BENDER

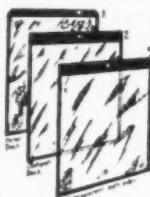
For steel, brass, copper, aluminum and other ductile metals, you'll find that the Wallace No. 10 Universal Bending Machine meets every need. Without heating, you can quickly bend light materials to various angles . . . S and U shapes, eyes, offsets, brackets and braces. Easily equipped to handle tubes and special sections. Maximum radius: 1 3/4". Rigidly built for long and hard usage. The Wallace No. 10 Universal Bender belongs in every shop. Only \$115.00. Write, phone or wire today for complete bulletin.

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Precision Die Made — Lowest Possible Cost.

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Our ROWBOTTOM cam cutting facilities are at your disposal for your cam requirements.

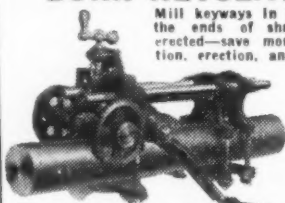
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Price \$6.50

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CUTTERS, METAL SAWS, ETC. - NEW!!**

We've made a terrific buy and we're passing the savings on to YOU!! ALL these tools are NEW - in Perfect Condition - NO SECONDS - NO REJECTS, at PRICES THAT MEAN SAVINGS UP TO 85%. Many are well known makes such as Union, Morse, National, Giddard & Giddard, Cleveland, Pratt & Whitney, Whitman & Barnes, Scully-Jones, Armstrong, Thurston, Brown & Sharpe, and others. Order now while we've got 'em at these BIG DISCOUNTS - They won't last long.



1950 CATALOG
Just off the presses.
Loaded with Machine
Tools, Pumps, Hydraul-
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Today!!



New Double Acting
Valve Pump Fittings
Hose and Tanks

HYDRAULIC CYLINDERS

51 Types, shapes. 1001 Labor Saving Adaptations for Pushing, Pulling, Lifting. Finest Precision Work. Materials. All Accessories, Fittings, Valves, Pumps.

Vickers Hydraulic Transmission

Self contained. 2 H. P. constant torque at all speeds with variable volume reversible piston pump (controlled by outside lever) supplying piston hydraulic motor. Automatic pressure, dash pot for smooth control. Power output R. P. M. 0 to 1/2 input R. P. M. 1800 continuous 4000 intermittent. Dash pot can be removed for greater R. P. M. Ideal for Lathes, Duplicator Setup on Mills, Conveyors, Small Cars, Drives, Gearing, Etc.

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Uni. Joints, Gear Trains, Power Take-offs, Drives Applicable to a Multitude of adaptations also available.



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We stock Aluminum, Magnesium, Brass, Copper, Steel in sheets, Bar Tubing and Angles, Plexiglass, Lucite, Phenolic, A & M Fittings, Rivets, Bolts, Nuts, Aircraft Supplies. Just arrived - 5,000 lbs. of 1/4" and 5/16" Plexiglass in full sheets of 1/8" Naccolite Plastic.

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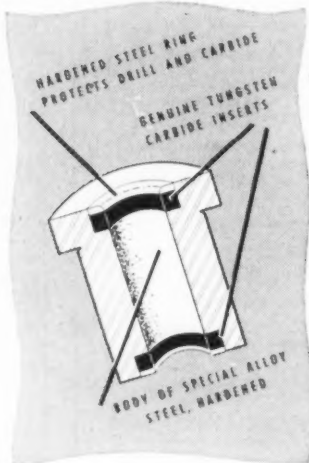
William J. Sparling has recently been elected vice president and manager, Chain & Transmission Division of Chain Belt Co., Milwaukee. E. P. Meyer succeeds Sparling as works manager; Roscoe O. Byers has been appointed factory manager, Chain & Transmission Division, of the firm.

John A. Robinson has been named regional sales manager for the Midwest, Northwest, Rocky Mountain and Pacific Coast areas for Brown Instruments division of the Minneapolis-Honeywell Regulator Co. He is succeeded in Chicago by Chas. E. Sharp as branch industrial manager.

When Writing Advertisers Please Mention MACHINE and TOOL BLUE BOOK

191

A DRILL JIG BUSHING —THAT'S DIFFERENT!



For information and
prices write for Meyco
Bushing Catalog No. 15.



W. F. MEYERS CO., INC., BEDFORD, INDIANA



MEYCO

**Carbide Inserted Bushings
live longer, cost less
in the long run.**

Here is a bushing that combines the best features of steel and carbide; the protection of steel and the long life of carbide. First cost: slightly higher than ordinary steel bushings; their life: many, many times as great. In addition to such obvious savings, MEYCO bushings increase the life of drills and reamers, produce accurate work for a longer period of time, save on machine-down time and on non-productive man-hours.

PUMP MAKER SAYS: "We have a jig setup where four holes are held to a limit of plus or minus .0005" on the spacing. In five months, after completing 50,000 parts, MEYCO bushings show no sign of wear."

Made to A.S.A. Standards; look into this "different" bushing, and cash in on the savings.

percentage of other carbides. By changing the type or amount of the auxiliary metals, the action of the composition can be regulated for thermal activity, strength, plastic flow and reaction to glass and metals. Kentanium is made in several grades so that it is adaptable to the particular case of the customer.

The greater resistance to shock is attributed to the fact that the composition has a low thermal expansion and a high thermal conductivity. A test for fatigue failure, a serious problem with metals at high temperatures, revealed that the composition withstood 1500 degrees F. at 50,000 lb. p.s.i. for 100 million cycles. It failed only after the pressure was raised to 62,000 lb. p.s.i.

Kentanium is a product of powder metallurgy and, at present, the size limitations (excluding extrusion) are those which can be contained

within a cylinder 4½" x 7½". It cannot be welded, forged or used for die casting. It can be given a fair braze and can be threaded, although mechanical means of fastening are recommended. It must be shaped with a grinding wheel (preferably diamond) and with the aid of a coolant.

Typical applications found for the composition are: hot spinning tools for steel tubing; thermocouple protection tubes for molten metal; valve seats for internal combustion engines; hot extrusion dies for copper and alloys; bushing and shears for guiding and cutting off hot rod. Made by Kennametal Inc., Latrobe, Pa.

TITANIUM COMPOSITION

Kentanium is the trade name for a new composition which retains great strength at high temperatures and is highly resistant to oxidation, abrasion and thermal shock. This achievement gives promise of outstanding results in material application, and already it has shown notable possibilities for jet engine blades, rocket nozzles, burner cones and punches which must endure wear at high temperatures.

The composition is essentially titanium carbide, nickel or cobalt, and a small

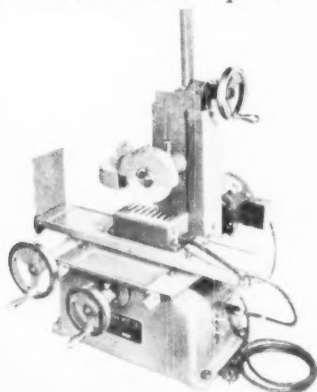
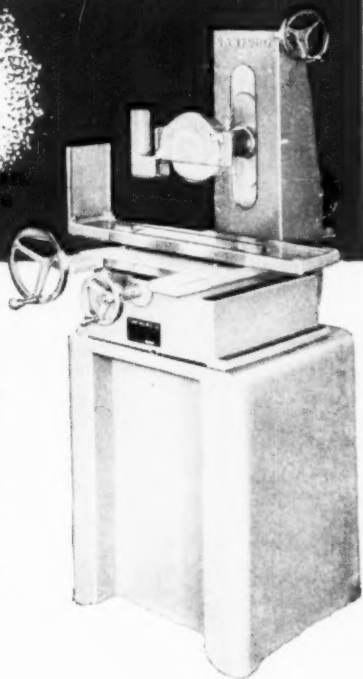
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surface grinders

Exceptionally sturdy, outstanding in quality performance and of long lasting accuracy.

Handles wide range of Tool and Production jobs, form and crush grinding, dry or wet.

Actual capacity: 8¾" transverse 13" longitudinal, 12" vertical under 7" dia. Wheel with adapter.



Accurate within .0001

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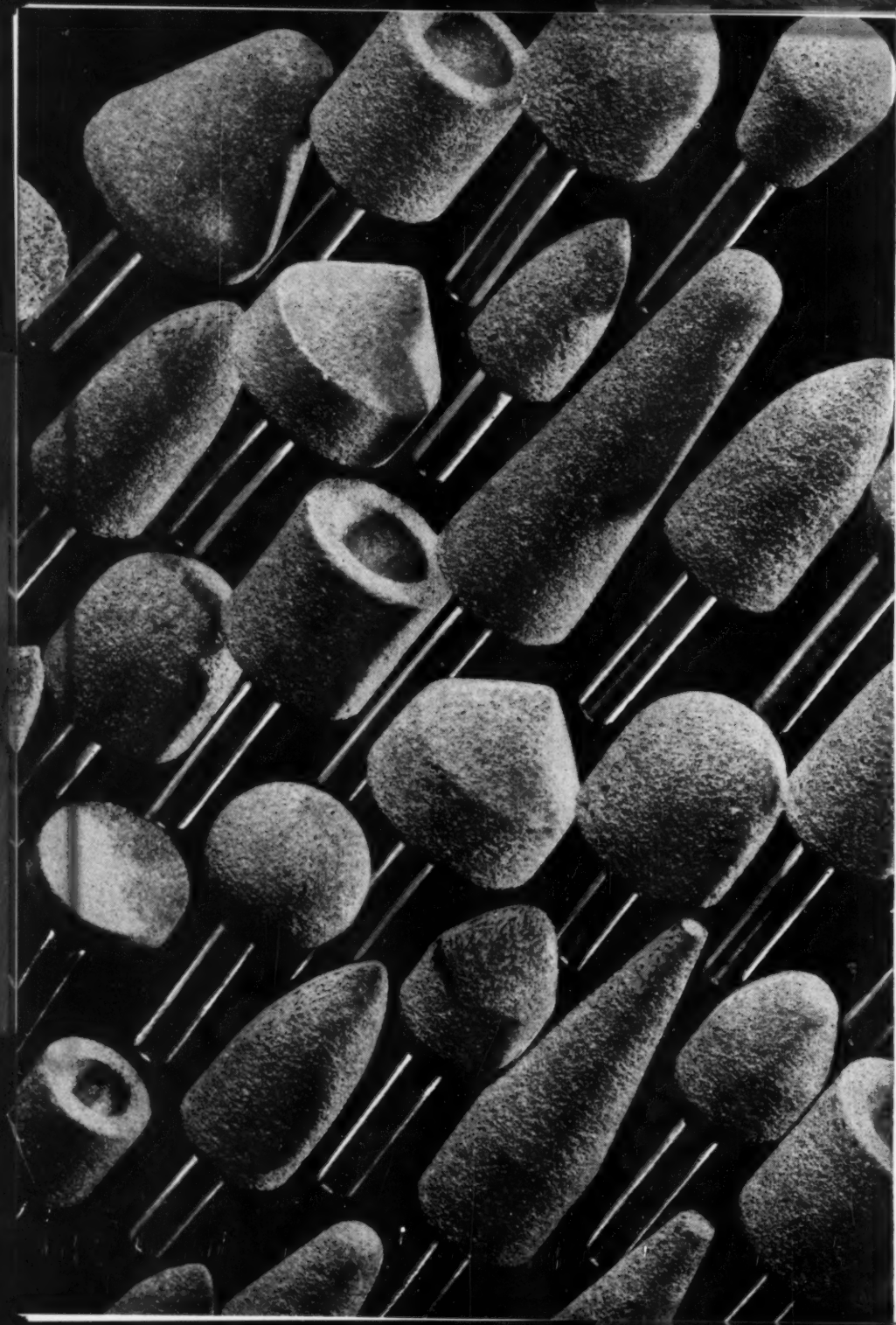
A sensitive, highly accurate machine specially designed "for the job that fits in your palm."

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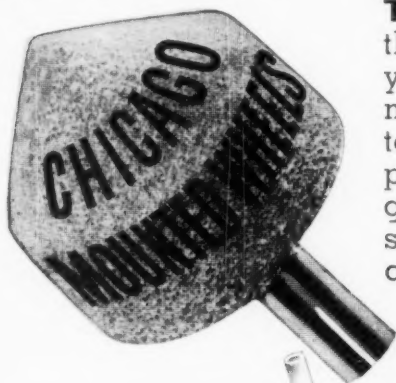
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OUT OF 1001 TEST TUBES

The Chicago Mounted Wheels you use today look simple enough—abrasive wheels mounted on steel shanks, but

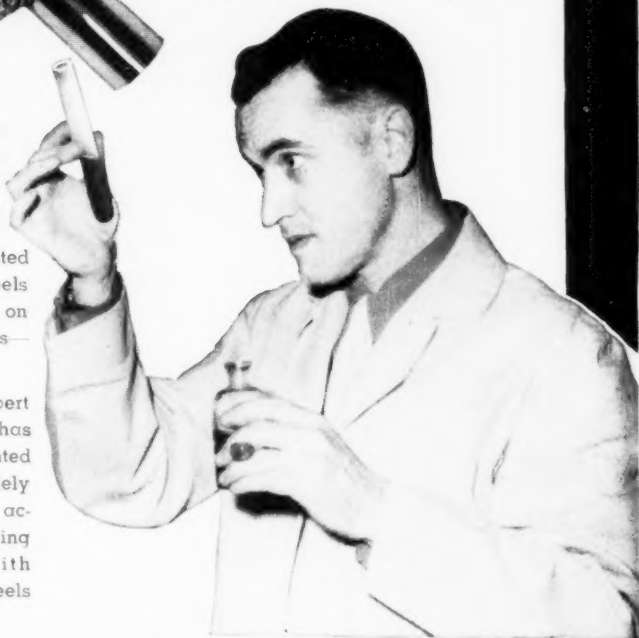


Those little wheels are the result of more than 50 years of know-how and more than 1001 tests to determine the most exactly perfect combination of grain, grade, bond, shape, shank length and steel analysis to do each job.

FORWARD LOOKING is the Word

Use Chicago Mounted Wheels—the first wheels ever to be mounted on their own steel shanks—today's finest.

AND, the same expert craftsmanship that has made Chicago Mounted Wheels the most widely used in industry today accounts for the outstanding results you get with Chicago Grinding Wheels and Cut-Off Wheels.



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Let us help you with your grinding problems. Send for our Engineering Data Sheet making it easy for you to submit information from which we can recommend the abrasives that will do your jobs best.

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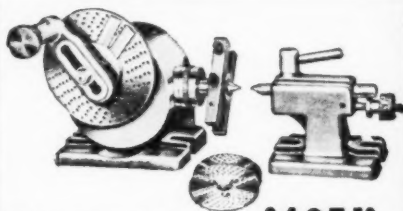
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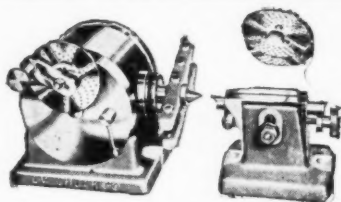
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Universal for complete in-
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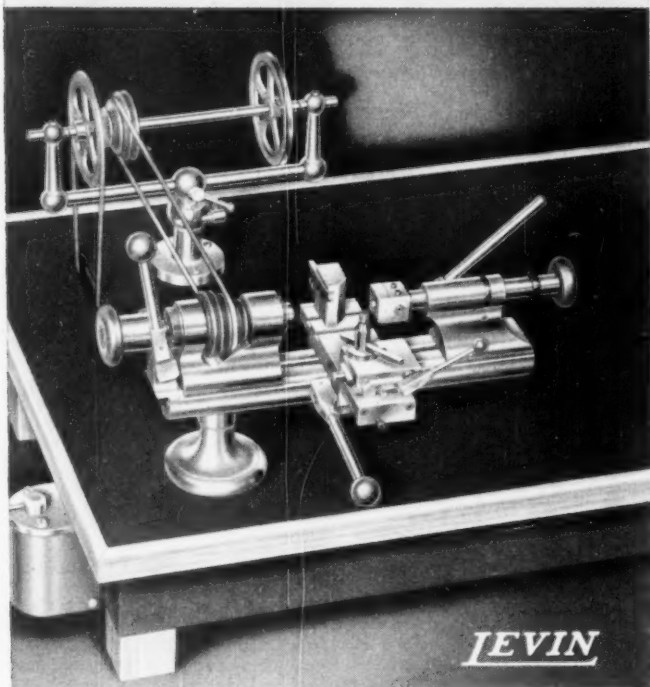


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PRECISION LATHES FOR SMALL WORK



Ideal for second operations on instrument parts or other small pieces. 4" swing—collet capacity 5/16" or 3/16". Send for Bulletin "F" containing a complete description of lathes and accessories.

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PACKAGING MACHINERY— AN ESSENTIAL TO MASS PRODUCTION

By L. E. Evans

Many companies avoid the purchase of packaging machinery for their operations as long as they can afford it. If they have need for more packages, they hire more people. Why is this? We often find that if the production volume warrants the capital investment and still equipment is not purchased; it is because of fear. Most people fear machinery which is unfamiliar to them. Packaging machinery looks complicated to the average person. Usually this is not true.

For the most part, packaging machinery is a combination of recognized mechanical movements engineered to produce the desired result.

Although there are deviations, there are three general classifications of packaging machinery. The first is the package maker. The second is the filler, and the third is the closer or sealer.

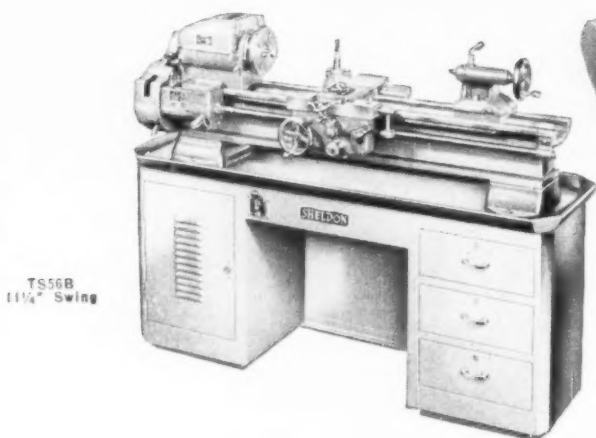
When attempting to set up an automatic or semi-automatic packaging program, it is a good idea to gather information from several sources. Too often machinery is purchased on the recommendation of an individual. After delivery it is found that this was not practical for the application. There are many manufacturers of what is known as standard packaging machinery. Perhaps 10 to 50 machines are made at a time. This permits a minimum of set up time to be charged against your purchase, and makes it

possible to obtain the machine at a reasonable price.

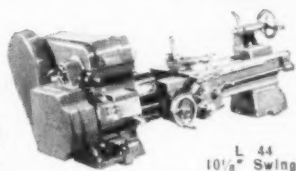
Many companies are missing great profits because of insufficient labor saving devices. A company must analyze its costs and calculate what it can afford to pay for packaging machinery. Over a period of years we have arrived at a more or less universal formula for determining if the investment is warranted. This is based on material and labor savings that can be expected. If the machine can be amortized in five years, it is warranted. If in less than three years, it is demanded.

SHELDON

When is a lathe too big?

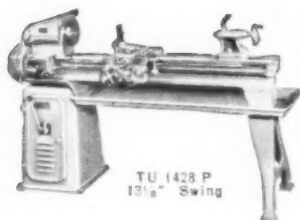


TS56B
11 1/4" Swing



L 44
10 1/2" Swing

**A lathe
is too big
when:**



TU 1428 P
13 1/2" Swing

- (1) When it is too large and complex for any but the most experienced to operate safely.
- (2) When the power cost is excessive for the tool load.
- (3) When the tool investment is out of all proportion to the requirements.
- (4) When it is too cumbersome and too slow.
- (5) When it takes up floor space, heat and light in which output could be multiplied with smaller machine tools.

Modern Sheldon Precision Lathes, eliminate these excess costs and loadings — leave far more on the profit side. 10" — 11" and 12" Swing. "Zero Precision" Tapered Roller Bearings. Increased collet capacity.

Write for catalog.

SHELDON MACHINE CO. Inc.

Manufacturers of Sheldon Precision Lathes • Milling Machines • Shapers
4242 N. KNOX AVENUE • CHICAGO 41, ILLINOIS, U. S. A.

What's New in METALWORKING

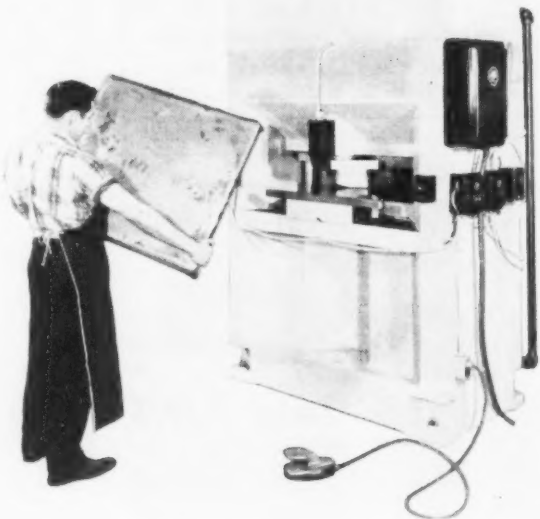
VULCAN HYDRAULIC DRAW PRESS FORMS PANEL CORNERS

The Vulcan Tool Company has announced the development and production of a **one corner at a time** hydraulic drawing press known as the Vulcan-draw.

Heretofore, the drawing or forming of panel corners has been an expensive operation, particularly when the fabricator's panel production schedule was not great, and where a variety of sizes were involved, necessitating welded corners and hand finishing. The manufacturer states that the Vulcan-Draw eliminates all of the costly die and labor operations usually associated with notched and welded corners.

The flat sheet is placed in position (one corner) in the Vulcan-Draw Press and the operator steps on an actuating pedal. In the few seconds hydraulic cycle, the sheet is released with the corner completely drawn and finish sized. By rotating, the other corners are formed, with specified over-all panel dimensions held. After side and end bending in the customary press brake, the panel is completely formed.

The Vulcan-Draw method eliminates the need for hand welding, and metal finishing operations, together with separate dies for each size panel. It also releases punch press equipment for other work.



The machine's unique design is simple and is therefore quoted as an inexpensive method, since to be practical, it must cost less than the dies and special equipment usually employed to form such panels, and form panels at a part cost, per corner or finished panel, far below conventional methods.

Since only one corner is dealt with at a time, various corner radii covering dif-

30% DISCOUNT ON STANDARD TOOLS

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CARBOLOY, VASCOLOY, CARMET,
FIRTHALOY and OTHERS

DIRECT FROM FACTORY sales policy permits unusual savings without sacrifice of quality, size or performance of carbide or steel.

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$1\frac{1}{2} \times 1\frac{1}{2} \times 3\frac{1}{2}$ " Standard Tool, CARBOLOY TIPPED, from other sources, lists at \$1.28 at less than package lots. OUR PRICE, EQUAL QUALITY, 30% LESS! This applies on 1 or 1000 tools. Normal transportation allowed.

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Semi-Standard and Special Tools to Order

Corundum Company, Inc.
1773 E. 87th St. Cleveland 6, Ohio

Low-Priced

ELECTRICAL Broken Tool REMOVER



See Your Dealer or
Write Us Today.

Only \$95

It's sensational — Every shop, every tool crib should have one. Removes broken tools and studs by electrical disintegration from a part being machined without damaging the part. Saves castings otherwise scrapped. Set it up on your drill press.

ELOX

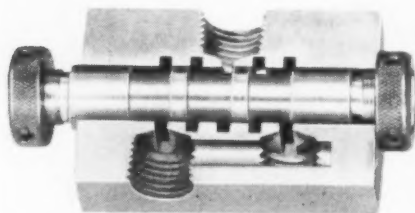
744 N. Rochester Road
Clawson, Michigan, U.S.A.
Phone, Detroit, Jordan 4-6173

ferent styled panels can all be fabricated in the same equipment. The tooling amounts to a simple single corner punch and die, which can be changed at will and within a few minutes, if a differently shaped corner is to be formed. Different panel sizes of the same style or product are, of course, formed by the same die. Most radii and any panel size from 15" x 18" to the largest panel handled can be corner formed economically from the flat sheet as received from the steel mill source, according to the manufacturer, **The Vulcan Tool Co., 730 Lorain Ave., Dayton, Ohio**

AIR VALVE CONTROLS COMPLETE AIR CYLINDER OPERATION

The Beckett-Harcum Company announces the Hi-Cyclic Air Valve. This device provides accurate, fast and smooth control for air power. These valves offer countless applications for the control of automatic and semi-automatic labor-saving machinery. The Hi-Cyclic Air Valve functions the same as any operating valve but in addition, will control the stroke of any air cylinder within .001"; it will stop and return the stroke at any point without overtravel; control the speed of stroke in either direction; it will reciprocate mechanically or electrically; control the pressure in both ends of the cylinder; and is claimed to effect tremendous savings in air.

The illustration below shows a cut-away view of the Model B Hy-Cyclic valve, which forms the basic component of all other Hy-Cyclic air valve models.



It is a spool-type valve with stainless steel piston, and the valve body constructed of bronze bar stock. The piston is fit to .0002". The valve is entirely corrosion resistant without packings or seals.

Intake air flows to both ends of the piston through dual pressure ports, equalizing the pressure on the piston and

providing balanced operation. The valve operates on a slight by-pass of lubricated air, which floats the piston, making possible fast operation, with no lag time.

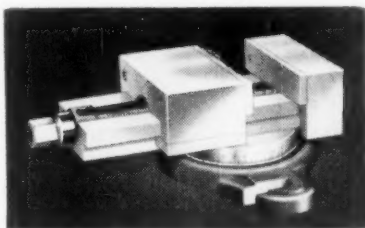
When working on a continuous or reciprocating operation, the Hi-Cyclic valve requires only a small movement of the valve piston to bring about a reversal of direction to the cylinder piston. Only a small amount of air is exhausted, and a corresponding amount of pressure air admitted to complete the reciprocating cycle. As the work load increases, the intake and exhaust of air will increase.

The valve operates on air line pressure as low as 1 p.s.i. or as high as can be delivered to it. However, the normal passage of air passing the closed lands, which is less than 2 litres per minute at 100 p.s.i., would increase in proportion to the increased pressure. This may be objectional on some holding operations at pressures over 150 p.s.i.

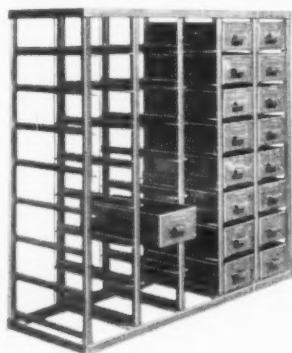
The Model B Basic Valve is also useful as a reciprocating valve, as it is capable of 2500 cycles per minute; it is also available as a spring loaded valve for cam operation or motor control and as a dual exhaust. The Hi-Cyclic Valve is made by **The Beckett-Harcum Co.**, 1140 Wayne Road, Wilmington, Ohio.

SMALL SOUTH BEND MACHINE VISE

A newly designed small swivel vise for holding work on shapers, milling machines, drill presses and other machine tools is announced by the South Bend Lathe Works. The vise jaws have replaceable hardened steel inserts 4" wide and 1" deep. The maximum jaw opening is 4". The base has two open slots spaced 7½" apart for bolting the vise to ma-



chine table. The vise swivels on the base and has 180° of graduations, reading from 0 to 90°, right or left. Positive swivel locking is provided by two socket head screws and plug binders. A wrench is included for operating the vise. Made by **South Bend Lathe Works**, 384 E Madison St., South Bend 22, Ind.



A KNOCKDOWN RACK in five foot units for convenience in setting up or moving when setup.

RACKING YOUR Boxes Saves Space

STERLING RACKS ARE MADE TO FIT YOUR BOXES, OR WITH BOXES TO FIT YOUR PRODUCT.

A STOCK ROOM FROM BIN FRONT STACKINGS SHOP BOXES.

SAVE TIME
No Emptying
of shop boxes
to stock bins.



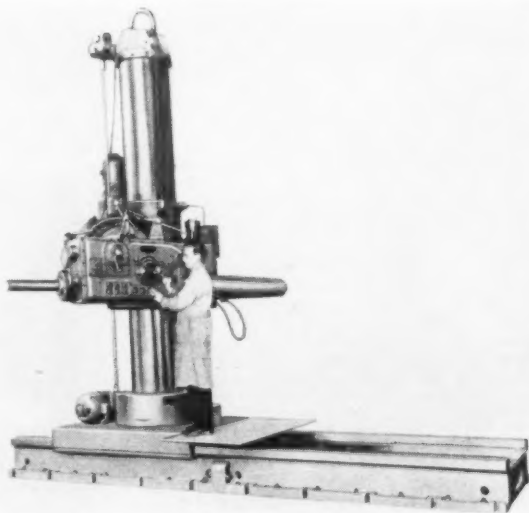
STERLING
FACTORY EQUIPMENT CO.

187 CHARLES ST.
PROVIDENCE, R. I.

NEW KAUKAUNA HEAVY DUTY MACHINE

A new heavy duty Horizontal Drilling and Tapping Machine, designated as Model 1040, has been developed by the Kaukauna Machine Corporation for boring, drilling, tapping, reaming and spot-facing operations. A spread of 10 to 20 h.p. provides sufficient power for handling a wide range of sizes on production or job shop work. The head swivels 45° up and down from the horizontal position and the column swivels 360° to increase the machine's flexibility and to eliminate the need for pit construction, trunnions and special holding fixtures. The unit can be used as a stationary machine, or as a portable unit with spreader arms, leveling jacks and lifting bail.

This new model is equipped with a 4" diameter spindle with 36" of manual and power feed and with a No. 5 or No. 6 Morse taper hole in the spindle. There

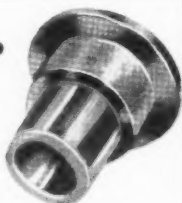


is a choice of three speed ranges from 25 to 300 r.p.m. and four feed ranges

LEAD SCREW TAPPING...

ON YOUR OWN DRILL PRESS!

With this ROTOREX tapping head you can convert your drill press to a precision tapping machine in a matter of minutes, and consistently produce Class III threads. To change to drilling, simply swing the ROTOREX to one side.



Precision ground lead screw provides accurate, controlled tapping from 0-80 to 3/4".

CHECK THESE FEATURES:

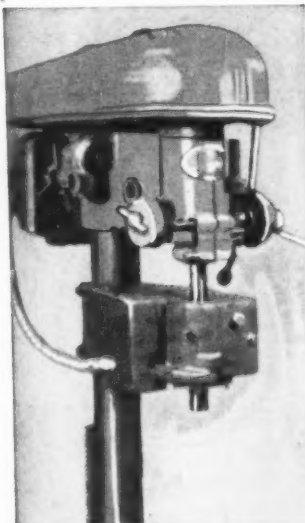
1. Positive, automatic control of lead.
2. Hardened, precision ground lead screws.
3. Instantaneous emergency reverse.
4. Complete automatic cycle.
5. Accurate control of depth—accuracy to .010.
6. Foot control frees operator's hand for loading.
7. Capacity 0-80 to 3/4".
8. Price \$195.00 complete with Lead Screw, F.O.B. Riverside.



HUNTER-DOUGLAS CORP.

Blaine & Pachappa Sts.

Riverside, California



giving spindle feeds from .0035" to .125" per revolution. Thread leads are provided for accurate tapping. An automatic tapping device mounted on the head stock permits accurate tapping to a predetermined depth, and also provides automatic spindle reverse when the desired tap depth is reached.

The entire rail and head assembly has 48" vertical power traverse on the column with inching controls for final tool positioning. The column and head unit are mounted on a heavy runway with 48 inches of horizontal travel. Inching controls and rapid power traverse are standard equipment.

The column is 22" in diameter and swivels 360°, to permit machining operations at any point around the machine. All swiveling units are graduated in degrees and half-degrees to permit accurate angular settings for any machining problem.

Spindle speeds and feeds are each selected by rotary selector levers with direct reading indicator dials showing the speed or feed engaged.

The machine is manufactured by **Kaukauna Machine Corp.**, Kaukauna, Wis., whose sales organization is **Bryant Machinery & Engineering Co.**, 400 W. Madison St., Chicago 6, Ill.

USEFUL PEN-TYPE OIL CAN

An oil can in convenient pen form, especially designed for oiling in the home, office, and factory, has been developed. It is useful to electricians, phone repairmen, sportsmen, tool and die makers, machinists, instrument repairmen, etc.



This novel oil can is provided with a clear visible oil reservoir. An extra long hypo-needle on the nose of the oil can makes even normally inaccessible parts reached easily, and oiled without damage or smearing. There are no working parts to get out of order. The oiler is simple to use—just a slight pressure on the chamber for a light film of oil—more pressure for a drop. The "Hypo-Oiler" is made by **Gaunt Industries**, 3521 N. Broadway, Chicago 13, Ill.

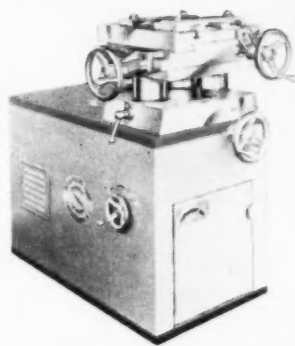
CUT DIE COSTS — CUT DIE COSTS — CUT DIE COSTS — CUT

CUT DIE COSTS — CUT DIE COSTS



Minutes . . . NOT HOURS . . . is the time required to mill complicated die and cam outlines with the new **ELECTRIX PRECISION DIE MILLER**! The die molder works ABOVE the piece to be milled with the carbide or high speed cutters underneath and protruding up through the work . . . resulting in the work being finished complete with straight sides or taper clearance. Every tool and die shop needs the **ELECTRIX DIE MILLER** for reducing costs and producing better work. Write soon for full details and prices. No obligation.

MILLING AND GRINDING



DIE COSTS — CUT DIE COSTS — C
INSIDE AND OUTSIDE SHAPES

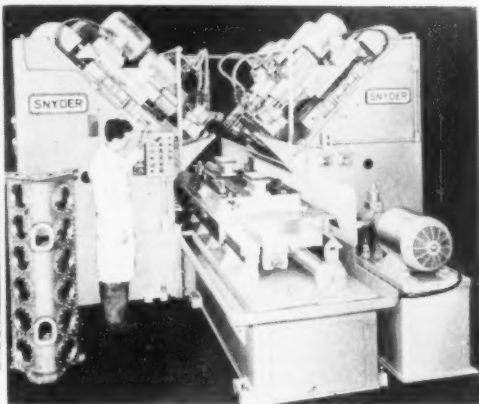
ROLL-FEEDS CORP. PAWTUCKET RHODE ISLAND

SNYDER MACHINE FOR PROCESSING ALUMINUM CRANKCASES

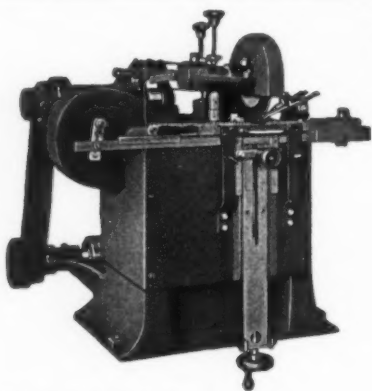
Snyder Tool & Engineering Company has designed and built a special-purpose, 11-station, line index, 90° V-type hydraulic feed machine to achieve greater efficiency in the processing of large aluminum crankcases.

The machine is entirely automatic after loading, and can be satisfactorily operated by unskilled help. Guide plates establish accurate positioning and the clamping is manual. A hydraulic shot bolt is provided to position the index slide before the heads start the operations.

The machine consists of a welded steel bed with hardened and ground steel ways, upon which is mounted the hydraulic index slide. On each side of the bed are mounted angular, welded steel columns, each of which carries two counterweighted Snyder standard units. Each unit carries a 14-spindle head. The columns carry, in addition, two tapping units with two 14-spindle, individual lead screw tapping heads. The part is automatically moved through the eleven indexes required.



A total of 168 cylinder stud holes are drilled, counterbored and tapped at a 90° angle with high speed steel tools which are hydraulically fed into the work. The gears are heat treated alloy steel with shaved teeth. All units are standard. Power is supplied by three 7½ h.p. motors at 1200 r.p.m.; two 7½ h.p. motors at 1800 r.p.m., and two 5 h.p.



Pays For Itself On A Single Gross Of Blades!

New hack saw blades are usually NOT ground after hardening. That is why blades resharpened on Wardwell EC Grinder will be sharper-than-new. Blades can be resharpened at least 6 times on the average.

ONE MACHINE SHARPENS HACK, CIRCULAR AND BAND SAWS

Wardwell Model EC Combination Grinder is the only single-unit grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. This unique feature enables operator to grind a variety of blades without dressing or changing wheels.

Write For **WARDWELL EC COMBINATION GRINDER BULLETIN**

THE WARDWELL

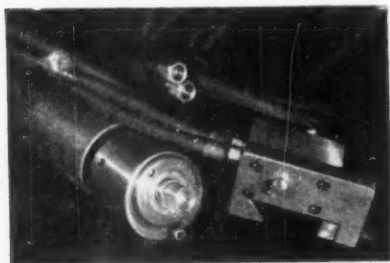
MANUFACTURING CO.
3165 Fulton Rd. Cleveland 9, Ohio

motors at 1800 r.p.m. The entire operation is electrically interlocked for safety. Time cycle is 2 minutes, 19 seconds, without loading and unloading time.

The base and column are welded steel, heavily ribbed for rigidity and thoroughly normalized. Coolant supply is in a separate tank with a motorized pump mounted on the back of the machine. Electric limit switches are completely protected from coolant. Lubrication is manual. The floor space required for the unit is 220" x 156". **Snyder Tool & Engineering Co.**, 3402 E. Lafayette St., Detroit, Mich.

NEW HYDRAULIC DIAMOND TURNER

Cleveland Industrial Tool Corporation has developed the 1001-A Citco Hydraulic Diamond Turner, designed specifically for dressing wheels on centerless grinders. When installed, it becomes a permanent part of the grinder machine and automatically repositions the diamond. The actual installation takes only about fifteen minutes.



The turning operation of the new Citco Turner is controlled by a valve which is automatically opened by the dresser unit. This operation turns the Diamond 3°, just enough to present a sharp, new cutting edge on the diamond without changing the amount dressed off of the wheel.

Citco Hydraulic Diamond Turners are stated to be made of the finest materials obtainable. All moving parts are hardened and ground. Rubber "O" rings are used on all diameters and all tolerances are held very close. Once installed, the units do not require further maintenance.

The manufacturers mill the hydraulic pipe grooves in the dresser barrel in their own plant and offer loaners while dresser barrels are in shipment.

Made by **Cleveland Industrial Tool Corp.**, 1080 East 222nd St., Cleveland 17, Ohio.

Buy KIPP AIR GRINDERS Because

The RPM's stay up while grinding... not only when the grinder runs idle.

It is an established fact that surface speeds must stay up to approximately a mile a minute if you want to grind — not just rub. The speed of Kipp air grinders drops but slightly when put to work. That means better work — longer wheel life.

Buy Kipp air tools for best results, lower prices.

MODEL JA
50,000 R. P. M.

\$42⁰⁰

IN U. S. A.



Weight 12 ounces;
length 6¾ inches;
chuck size ⅝ inch.
Wheel guard re-
moved for better
illustration.

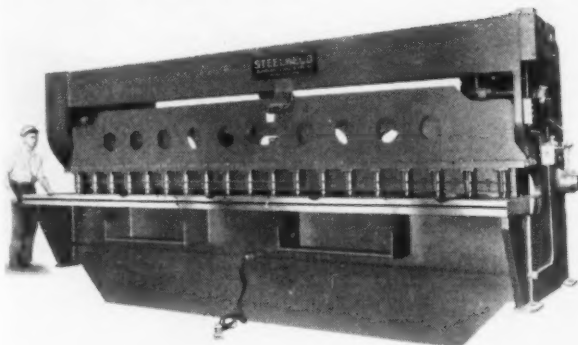
MADISON-KIPP CORP.
207 Waubesa St., Madison, Wis., U. S. A.

- Skilled in DIE CASTING Mechanics
- Experienced in LUBRICATION Engineering
- Originators of Really High Speed AIR TOOLS

LONGEST STEELWELD SHEAR ANNOUNCED

The longest Steelweld Shear built to date has just been completed by The Cleveland Crane & Engineering Co. It has a shearing capacity of 18 feet of 3/16" mild steel at 50 strokes per minute. It operates on the pivoted-blade principle; that is, the blade travels in a circular path without the use of customary guides and slides common with guillotine-type shears. Thus, difficulties from wear at these points are eliminated.

Ball bearing transfers are provided in the bed, facilitating movement of steel through the knives. A motor-operated back gauge with slow and fast control buttons located conveniently at the middle front of the machine makes it easy to position material accurately to be cut. Because the back gauge indicator is readily seen through the oblong slot in the hold-down beam, the operator need not walk to the end or rear of the shear to adjust the



gauge, and many time-consuming steps are thereby saved. This indicator reads in inches and 1/64ths.

The shearing action is controlled by an electrically-operated foot switch which can be moved about the floor at the convenience of the operator. The foot switch substitutes tireless toe action for

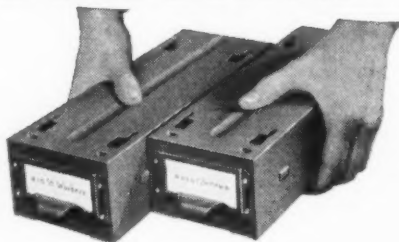
25% TAKE ADVANTAGE OF THIS PRICE REDUCTION

12 Large Multi Drawer Units

Size 11 1/16" x 3 1/16" 3" **Now \$11.75**
deep, less than 12—99c each were \$1.29 each.

12 Small Multi Drawer Units

Size 5" x 2 7/8" 2 1/4" **Now \$3.50**
deep, less than 12—30c each were 40c each.



Solve Your small Parts Storage Problem with All Steel Multi Drawers. Easily assembled to fit any size or shape space. Positive, Rigid Interlocking.

If your local dealer cannot supply you send your order **DIRECT** with check or money order.

Jobber and Dealer Inquiries Invited.

THE CINCINNATI VENTILATING CO.
INCORPORATED
Dept. B COVINGTON, KENTUCKY

**MULTI
DRAWER**

the knee action required by the conventional foot treadle.

Frame and blade are of all-welded steel, one-piece construction with the heavy bed extending below the floor. The bed and crown are welded to the end housings, thus forming an integral unit having great strength, while assuring minimum deflection and long-time accuracy.

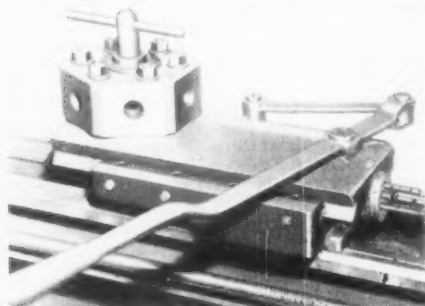
The ease with which knife clearance is adjusted to suit thickness of the plate being cut is an outstanding feature. The operator simply turns a convenient hand-crank and observes a large dial indicator. When the hand is on the figure corresponding to thickness of metal being cut, the machine is ready to go. The entire operation is handled in a matter of seconds, assuring maximum knife life.

The Steelweld Shear is made by The Cleveland Crane & Engineering Co., Wickliffe, Ohio.

ENCO HAND LEVER HEXTURRET

Enco Manufacturing Company announces their new Hand Lever Hexturret, a companion of the Enco Pilot Wheel Hexturret.

This new Hand Lever Bed Turret, illustrated below, is available for all lathes from 9" to 12" swing and can be furnished with either a 4 1/4" or 6 1/2" working travel. Many of the features available

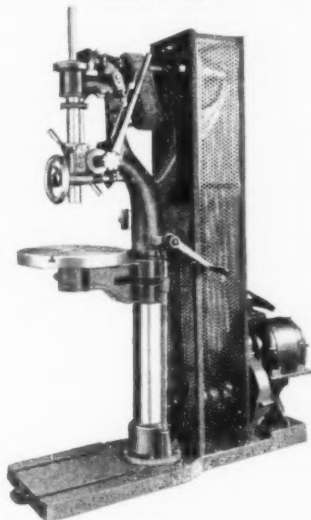


in the pilot wheel model have been incorporated in this hand lever model, such as hand scraped and spotted bearing surfaces, hardened indexing mechanism and rigid top side clamping.

Because of the extreme accuracy of the Enco Hand Lever Hexturrets, they are stated to be particularly adaptable for close tolerance work in plastics, aluminum, brass and mild steel.

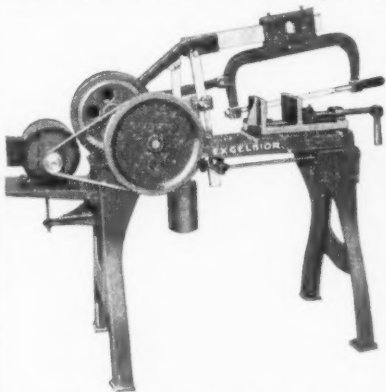
Write for Bulletin No. 410 describing this model. Enco Manufacturing Co., 4524 W. Fullerton Ave., Dept. 2118, Chicago 39, Ill.

ROYERSFORD-EXCELSIOR 21-INCH MOTOR-DRIVEN BACK-GEARED DRILL PRESS



1 1/2" Drill Capacity
V-Belt or Gear Drive

M2A HACK SAW 6" x 6" Capacity



Write today for free descriptive literature.

**ROYERSFORD FOUNDRY
& MACHINE CO., Inc.**

BOX B

ROYERSFORD, PA.

SELF-CONTAINED BENCH TYPE DUST COLLECTOR

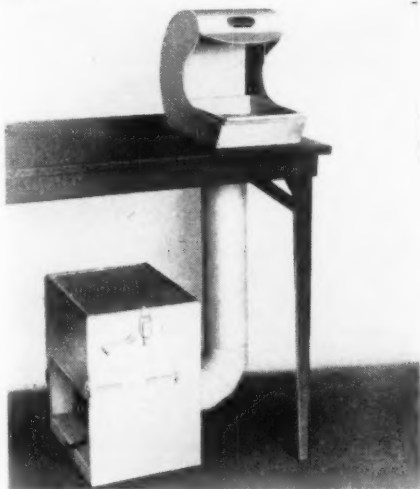
Model 331D Dustkop dust collector is a complete small-size dust collecting system, intended for laboratory, small-wheel grinding, buffing, polishing, jeweler work, etc. Rated in excess of 300 c.f.m., this new Dustrop unit is especially designed for installation where space is limited.

The Model 331D is supplied complete with the bench-top hood, sheet metal pipe and elbows, for rapid installation.

Suction is supplied by a paddle-wheel fan direct driven by a $\frac{1}{4}$ h.p. continuous duty motor. A special type dust separator plus a non-inflammable spun-glass filter provide a two-stage means of cleaning the air of its dust before it is returned to the working space. A hand-crank on the side of the unit provides for periodic shake-down of the spun-glass filters which can be easily and inexpensively renewed. The collected dust is removed by means of a clean-out tray.

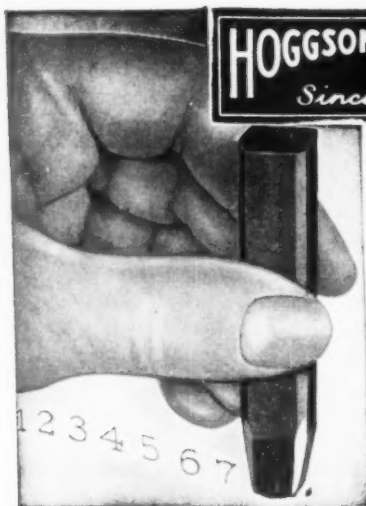
Quiet operation permits this unit to be used in offices and office buildings, while its compactness (12" x 14", with 18" overall height) permits installation almost anywhere.

The hood is provided with a socket for light bulb; two removable trays, one for



wet and the other for dry grinding, are also supplied.

Installation usually requires only the



HOGGSON BRAND
Since 1849

HAND-CUT STEEL STAMPS Letters & Figures

Deep, hand-cut letters in special-formula steel—result of 90 years of die making—assure clean impressions and long service. Face of stamp is angled for extra strength. Ideal for parts and tool marking and numbering. Also made in reverse for marking molds and dies. At mill supply houses.

Chamfered
corners
for
locating
the base.

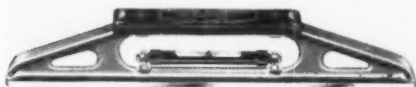


HOGGSON & PETTIS MFG. CO., New Haven, Conn.

cutting of a hole in the bench top to admit the pipe; otherwise tools are not required, since the sheet metal pipe and elbows make a slip fit with the hood and with the collector. The unit is fabricated throughout of heavy gauge steel spot-welded construction. Agat-Detroit Co., Main at Washington, Ann Arbor, Mich.

PRECISION ALIGNING LEVEL

Production cannot attain modern high standards unless the machine tools which are responsible are kept level. The constant vibration, settling of buildings and floors and the ever-present molecular changes of cast iron and steel, all work against the maintenance of accurate machine level. Many excellent machine tools are unnecessarily out of alignment, with their bearings showing signs of wear and increased horse-power needed. Such conditions may be avoided by the proper maintenance of level.



The Bullard Company has introduced its Precision Aligning Level; it has been thoroughly tested in the field, and reports substantiate the manufacturer's claims for accuracy. The level is furnished in 18-inch and 27-inch sizes.

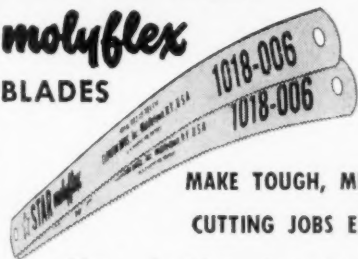
The vial is made of the best optical glass, specially ground, filled and guaranteed. The vial is mounted on two brass studs, permitting adjustments in the same manner as the level vials on fine surveying instruments. The bubble in the vial has a guaranteed sensitivity of 5 seconds of arc per graduation—equivalent to showing per graduation on vial a variation of .003" per foot.

The level casting is insulated from body heat of the palm of the hand by means of a handle of special non-conductive material. The casting has been carefully seasoned, machined and scraped. The level is protected when not in use by a felt-lined box. It is made by The Bullard Co., 286 Canfield Ave., Bridgeport 2, Conn.

NEW STAR

molyflex

BLADES



MAKE TOUGH, METAL

CUTTING JOBS EASY!

Here's the blade that will help you cut costs . . . speed up tough metal cutting jobs. These new "Molyflex" High Speed Hand Hack Saw Blades combine the ability to cut the hardest materials with a toughness and resistance to breakage that is unsurpassed. They're shatter-proof too!

In recent tests, when pitted against eight leading competitive blades in cutting SAE 52100 ball bearing steel . . . STAR'S new "Molyflex" AVERAGED 23.8% MORE METAL CUT than all the leading brands tested!



STAR STEELRITE

METAL MARKING CRAYONS



Ask your STAR distributor about these new and improved metal marking crayons. Available in a variety of sizes, these crayons, made of genuine soapstone by special extrusion process, are uniform in strength and composition. Markings can be made on hot, cold, damp or grimy metal and withstand pickling, yet do not affect enamel application.

Get your free copy of STAR'S "Metal Cutting" Booklet and the STAR Wall Chart for your shop! Both are packed full of useful information and will help you get maximum results from hand, band and power hack saw blades.



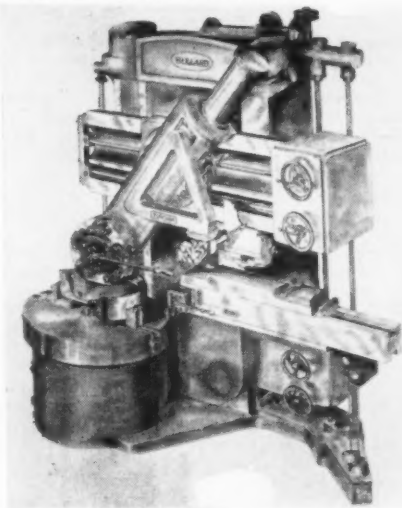
CLEMSON BROS. INC.
MIDDLETOWN, NEW YORK

Manufacturers of Hand and Power Hack Saw Blades and Frames, Metal Cutting Band Saw Blades and Clemson Lawn Machines.

ANGLE FOLLOWER ATTACHMENT FOR VERTICAL LATHES

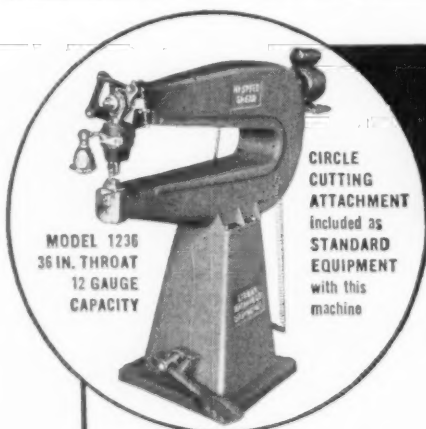
Another new field of tracer turning is now available by equipping a vertical lathe with a Turchan Follower which controls the movement of the tool at an angle to the center-line of lathe. This combination allows boring, facing and o.d. turning of jobs with flanges, steps, tapers, shoulders, radii and thread run-out grooves to be machined automatically with uninterrupted cuts over the surface that otherwise would be too large to do on the conventional lathe, Turchan equipped.

Many jobs which vertical lathes can do today require form tools which could be eliminated, along with the constant miking required by the operator. Once this Turchan Follower arrangement is set-up, all sizes and forms are obtained automatically, eliminating the skills of the operator. Set-up time is reduced to a minimum, since it requires only the proper relation between tool and tracer. Once this is obtained and the first diameter is cut for size checking, all other shapes and sizes are obtained entirely by tracer control over the tool; the operator needs only to shut off the feed at the end of the operation. For production jobs, the complete cycle could be made automatic from beginning to end, in-



cluding the return of tool to the starting position.

Numerous combinations are possible



MODEL 1236
36 IN. THROAT
12 GAUGE
CAPACITY

CIRCLE
CUTTING
ATTACHMENT
included as
STANDARD
EQUIPMENT
with this
machine

LIBERT MACHINE CO.
GREEN BAY • WISCONSIN

**for BETTER
PRODUCTION and
MAINTENANCE
*at lower cost***

A proved time-saver in any sized shop. Libert's *flexibility* gives you a wider variety of work—clean shearing of flat or formed sheet metal... straight or irregular shapes... inside or outside cuts. Libert *simplicity* means that even unskilled labor soon does accurate work, lots of it *and fast!*

Write for bulletin.

Made in sizes up to 60 in. throat, 10 gauge capacity

Libert *Hi-Speed* **SHEAR**

for each job. Where complete automatic production is desired with tracer controlled movements, the device can be made to suit, thus eliminating all human errors. If needed on several jobs, it is possible to equip more than one turret slide and each can be made fully automatic.

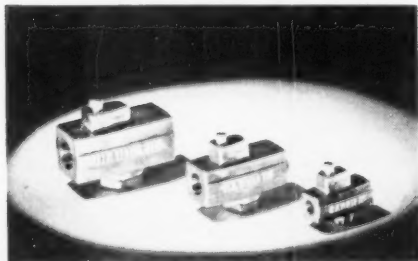
With all the combinations of movements obtainable through tracer controller tools, a new field of turning on vertical lathes is now possible. There are automatic set-ups available for other types, but not with the simple tooling obtained with this arrangement. The best use of carbide tools of standard design is available in most cases and, where necessary, they can be used with slight modifications. The elimination of form tools is one of its chief virtues. The conventional tool is claimed to produce better surface finish on the work than can be obtained by form tools.

The light tracer tip pressure allows the lightest of templates to be used. With pressure against the model being in ounces and the total pressure holding the tool in position being in thousands of pounds, simple templates can be made out of light stock. By changing the template, the machine is then capable of reproducing a new job. This is useful when short runs are necessary. The templates can be stored and used again whenever needed. All of the above combinations come close to obtaining a perfect means of turning on the vertical lathe.

This attachment may be supplied to any size, make or model vertical lathe. It is made by **Turchan Follower Machine Co.**, 8265 Livernois Ave., Detroit 4, Mich.

NEW HANNIFIN SPEED CONTROL VALVE

A new, improved Speed Control Valve for use on pneumatic cylinders is announced by Hannifin Corporation. This

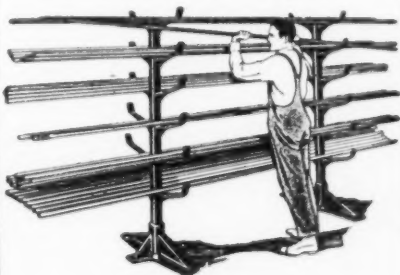


compact new valve employs a guided poppet of ample diameter to allow full, pipe-size flow toward the cylinder (in the



HOW YOU CAN BOOST YOUR PROFITS

The **BROWN TIME-SAVING RACK** saves the time previously lost end-hauling each bar of stock its entire length from the old-style, closed-side Rack, the Brown Rack requiring but a few inches of side movement. Each length, width and thickness of stock is displayed in gold-fish visibility for instant selection. Workmen waiting for stock are served without waste of time, and returned to their production machines to turn out a maximum of output.



Any time you require additional storage space, all you need do is to add more units. If you want to relocate it at any time, you can do so quickly for it is unattached to the building. It is a simple, durable article made of metal in five styles. It can't burn, warp, sag or twist; depreciation is practically nil.

SEND FOR BULLETIN No. 26-B DESCRIBING THE BROWN TIME-SAVING RACK.

BROWN ENGINEERING CO.

126 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

Rouse
**NEW HAND MILLER
 ATTACHMENTS MAKE
 MILLING SMALL PARTS
 Faster, Safer...**



The new Vise's specially slotted removable jaw enables it to hold odd shaped pieces, considerably increasing the Hand Miller's production. The new Safety Cutter Guard makes hand injuries virtually impossible.

The Rouse Hand Miller is an efficient, high speed, ball bearing, motor-driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials. It mills small parts fast—accurately—inexpensively, eliminating costly set up time and making it possible to use ordinary, inexperienced help.

WRITE FOR ILLUSTRATED CIRCULAR

H. B. ROUSE & COMPANY
 2214 N. WAYNE AVE., CHICAGO 14
 50 YEARS OF SERVICE TO INDUSTRY

direction of the arrow on the body). It provides metered flow away from the cylinder by means of a large diameter, tapered, valve stem which is threaded to permit sensitive adjustment from zero c.f.m. to maximum capacity. For speed control in both directions on double-acting air cylinders, two valves are used—one in each of the lines leading to the cylinder ports.

An "O" ring seal above the threads on the metering valve stem provides a safety feature. Well before the threads disengage, this seal is lifted to a point where it no longer seals, so the escaping air around the valve stem will warn the operator that the point of maximum adjustment has been passed. A few reverse turns restore the seal, and there is no danger that an operator will remove the valve stem while air pressure is on.

Construction of the new "Type S" valves is entirely of corrosion-resistant materials and suitable for use on pressures up to 150 p.s.i. The poppet is faced with synthetic rubber to provide a positive seal and is loaded with a long-lasting phosphor bronze spring. All parts are accessible for inspection without breaking line connections. The new valve is made in 1/4", 3/8", 1/2" and 3/4" pipe sizes by Hannifin Corporation, 1130 S. Kilbourn Ave., Chicago 24, Ill.

SLIP JOINT COMBINATION PLIER

This new development in slip joint pliers with offset pistol-grip handle fits the natural hand grip and enables the user to reach hard-to-get-at jobs. Normal pull on the handles tightens the grip on the work and gives more holding power for wire twisting or pulling.

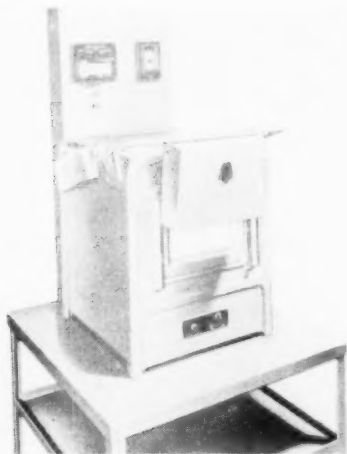


The pistol-grip gives efficiency with less effort, and reduces wrist fatigue, prevents slipping and skinned knuckles.

The No. 550-8" is drop forged of alloy steel and is another product in the quality line of Utica Tools made by Utica Drop Forge & Tool Corp., Utica 4, N. Y.

BENCH TYPE HEAT TREATING FURNACE

To meet a demand for greater capacity in bench type heat treating furnace equipment, Cooley Electric Mfg. Corp. introduces a new furnace, having chamber dimensions of 10" wide, 8" high, and 18" long for operation to 1850° F. It will be offered in two models, VH-48 and VK-48.



The VK-48 model is equipped with a selective power modifier which permits manual setting of power input at any point from 5% to 100% of full rating. Operating with a control pyrometer, both high and low temperatures may be held at close limits. With this combination, the usual low temperature overshooting is largely eliminated, and when tempering of the type which has to be held within narrow temperature limits is being performed, accurate results can be obtained.

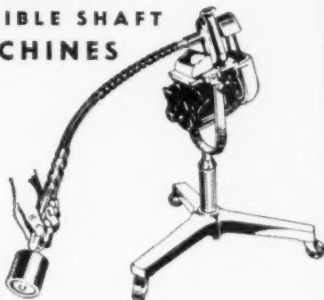
The VH-48 model is designed for controlling pyrometer operation but without auxiliary control equipment. It is adapted to hardening and to tempering where the uniformity at the lower temperature is not too critical.

Either of these models is useful in tool and die hardening and tempering, and as a furnace for both batch production runs of small parts. The chamber dimensions are such that the size and shape of the working space makes these two models desirable for the increasing practice of pack hardening.

Made by Cooley Electric Manufacturing Corp., 36 S. Shelby St., Indianapolis 7, Ind.

Elliott

FLEXIBLE SHAFT MACHINES

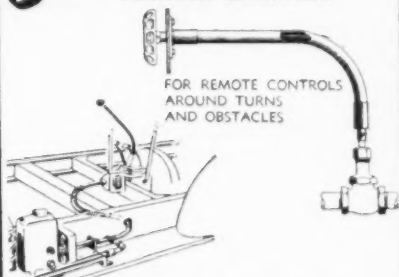


Over **22** high quality models to meet every industrial need *plus* a complete line of accessories.

All Elliott equipment is backed by over 50 years of experience and "know how" in flexible shaft manufacturing.

Elliott

FLEXIBLE SHAFTING



FOR POWER TAKE-OFFS
TO ADJUSTABLE OR
OUT-OF-LINE PARTS

Write for
Catalog 49
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Elliott

MANUFACTURING CO.

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Amazing
**PRODUCTION
RECORDS**
because

**MOTOR TOOL
LIVE CENTER**

is the **ONLY** Center
with the
**OVERLOAD
INDICATOR**

Look for the RED BAND

You no longer have to guess whether you are overloading your live center thrust bearings if you use **MOTOR TOOL LIVE CENTERS**. When the load is too great the **RED BAND** around the spindle disappears into the housing. You can see at a glance when overloading occurs. This is an exclusive feature, developed by Motor Tool which cuts repair costs to practically nothing if due diligence is exercised. As long as the **RED BAND** is visible you are running **COOL** and **SAFE**.

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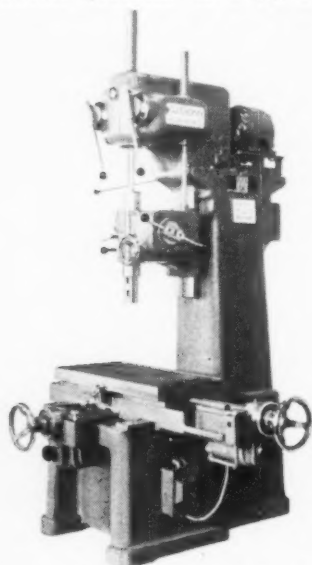
NEW descriptive folder and verified case histories of how **MOTOR TOOL LIVE CENTERS** have out-performed and outlasted **ALL** other centers on exceedingly tough, continuous-run jobs.

MOTOR TOOL MFG.CO.
8663 DAYTON ST. DETROIT 10, MICH. PHONE OR-0343

Make it a Rule
to Call Motor Tool

CLEEREMAN LAYOUT DRILLING MACHINE

The new Cleereman Layout Drilling Machine is designed to handle work which requires more accuracy and facility than is possible with a drilling machine and yet which does not require the extreme precision of a jig borer.



This machine is convenient for drilling, boring, tapping, reaming, milling and similar operations. It is applicable to tool work, plastic, rubber or die casting molds, and to blanking, punching, forming and drawing dies within its designated limits, as well as experimental work and jigless production of small lot manufacturing.

The layout machine is provided with a combination boring and drilling spindle with No. 4 Morse Taper with lifetime lubrication. Preloaded ball bearings are used at the nose end with an upper steadying ball bearing and a coupling type connection between the spline shaft and the spindle in the top of the quill. The spindle quill is chrome plated and the rack is $\frac{1}{4}$ pitch. The tang slot has a hardened steel insert. A spindle binder on the sliding head and a retaining key slot in the spindle nose provide for milling operations. The sliding head has a friction type feed clutch with automatic adjustable depth "kickout," and the spindle is counterbalanced in a unique manner that eliminates backlash between the spindle feed rack and pinion.

The movements of the saddle and table are controlled by hardened and ground precision lead screws accurate to .0001" in 24", with 6-inch diameter micrometer dials graduated to .001" and verniers to .0001". With screws of this accuracy and the alignment tolerances held on the machine, work tolerances can be easily held within .001" per foot.

Reference scales graduated to eighths with adjustable pointers for quick, convenient reference; "one shot" lubrication system for table, saddle and bed mechanism are among the many features.

Manufactured by **Cleereman Machine Tool Co.**, Green Bay, Wis., whose sales organization is **Bryant Machinery & Engineering Co.**, 1400 W. Madison St., Chicago 6, Ill.

NEW COUNTING AND MEASURING MACHINE

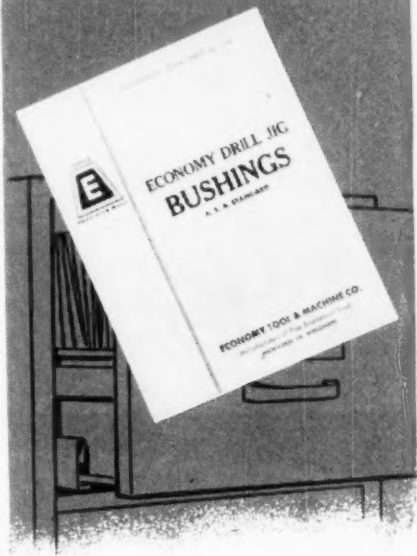
The Durant Manufacturing Company announces the addition of a new top-reading rotary unit to its line of Productimeter Counting and Measuring Machines. Designated as the "CS" model, this counter features large-size figures for clear legibility and a case made of a single die casting, giving the counter great rigidity, a tight seal of working parts, and smoothness of appearance.



Both reset and non-reset models are stocked in four-figure cases; five and six-figure sizes are available. The counter is compact and rugged, with a flush mounted window to assure good visibility. It is furnished for either clockwise or anti-clockwise rotation in standard 1:1 or special ratios; it is finished in pleasing grey wrinkle enamel, and has a speed of 600 r.p.m.

The new "CS" counter is especially designed for incorporating on original equipment, such as machine tools, textile, measuring and office machinery. Made by **The Durant Manufacturing Co.**, 1928 N. Buffum St., Milwaukee 1, Wis.

THIS BULLETIN BELONGS IN YOUR DATA FILE



- It gives you price and specification data on Economy Drill-Jig Bushings — all A. S. A. standard types and sizes for immediate delivery. Write for your copy today.

Also quickly available:
new gages and gages salvaged
by hard chromium plating.

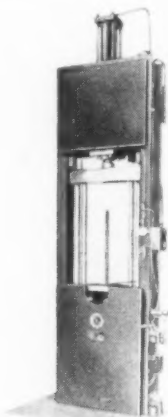
Economy

TOOL & MACHINE CO.

1829 S. 68th St., Milwaukee 14, Wis.

WILSON HYDRAULIC COMBINATION PRESS-BROACH

A combination Press-Broach which should find wide use, particularly in smaller plants, is announced by K. R. Wilson. This new combination unit is designed for "push pull" operation in either vertical or horizontal operation.



It will be available in 25, 50 and 60-ton capacities. When used as a broaching machine, tonnages can be varied from one ton to the unit's capacity. The ram stroke range varies from 7" to 54". Ram speeds and top tonnage pressures depend on the type and capacity of the motor and hydraulic pump equipment supplied, of which there are ten units to choose from.

The pressure gauge, located at eye level, is equipped with a pressure dampener to prevent damage resulting from sudden pressure drops. A pressure regulating valve permits selection of any pressure within rated capacity. A manually operated four-way valve permits instant and precise finger-tip control of the ram. The hydraulic system has a 20-gallon capacity reservoir which distributes through seamless steel tubing. Location of the pumping unit may be either in the base or at top of the machine. All electrical controls are standard. Cutting oil is supplied through an independently motorized coolant pump from a 15-gallon reservoir.

For push broaching, an adapter is screwed into the upper cross bar, the

RIDERMIKROKATOR

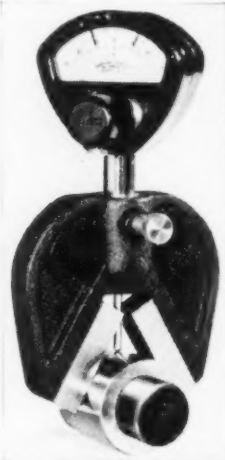
... for OUTSIDE MEASUREMENTS

The Ridermikroktor is intended for checking out-of-roundness and diameters of cylindrical parts. As the measurements are carried out according to the three point principle the instrument can be used to good advantage for checking centerless-ground pieces.

They are provided with hardened, ground and lapped anvils and insulating grips. The measuring surfaces of the anvils can be tipped with cemented carbide. Price on application.

This instrument is supplied with removable measuring points with ranges from 3/16" to 4 3/4".

PRICES AND LITERATURE UPON APPLICATION



Setting Ridermikroktor by means of a master.

SWEDISH GAGE CO., OF AMERICA
8900 ALPINE AVE., DETROIT 4, MICH.

broach is inserted and held by a slot and key. For pull broaching, a similar adapter is inserted in the lower cross bar. A flat nosed adapter is furnished for attachment to the upper cross bar to handle many types of pressing and forming work. The Press-Broach is made by **K. R. Wilson**, 215 Main St., Buffalo 3, N. Y.

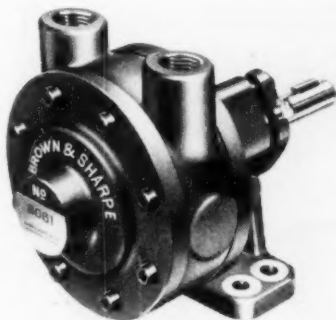
BROWN & SHARPE AUTOMATIC REVERSING PUMPS

These pumps are an important addition to the Brown & Sharpe expanding line of pumps, offering nine styles and sizes. Of a new vane type, made either as complete pumps or as stripped models, they possess many interesting features.

Models No. 8021, 8026 and 8101 consist of the complete pumps (illustrated) having provision for mounting the foot at top or bottom or on either side. Designed for continuous operation against pressures up to 100 lbs., the capacities in g.p.m. at 0 lbs. pressure are, for the No. 8021 from .6 to 2.5; No. 8061 from 1.4 to 5.4; and No. 8101 from 2.9 to 11.5.

Similar capacities are available in stripped models without housings. These designs meet the growing demand of

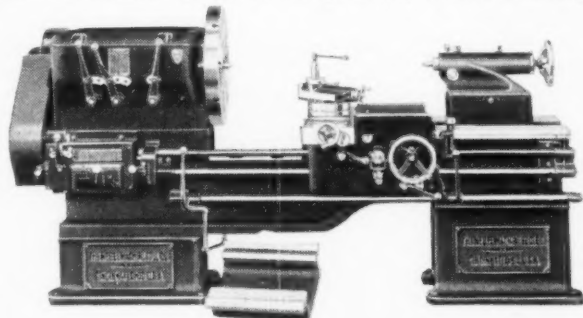
original equipment manufacturers for built-in or integral pumps. Designers with a view to streamlined appearance and economy will recognize their advantages, particularly where the power source is reversing. Outstanding exam-



ples of such applications include diesel engines, compressors, blowers, machine tools, speed reduction units, etc. **Brown & Sharpe Manufacturing Co.**, Providence 1, R. I.

NEBEL Removable Block Gap Lathes

furnished in the Geared Head Motor Driven Type, 3 Step Cone Double Back Gear Belt Driven Type or with Motorized Headstock. Especially adapted for repair and maintenance as well as for general manufacturing. Handle a large variety of work with large swing through the gap.



All Geared headstock type completely equipped with Timken Bearings, with motor mounted on rear of lathe. Quick change gear box, compound rest, steady rest, chasing dial, face plate, driver plate, wrenches, tool post and centers.

Furnished in four different sizes as follows: Series "LN" 18/27", Series "AA" 20/30", Series "B" 22 3/32", and Series "D" 25/40".

Write for Circular Giving Complete Information

THE NEBEL MACHINE TOOL COMPANY
CINCINNATI 25, OHIO

**Faster, More Efficient
Heat Treating**

***Quick Acting*
JOHNSON FURNACES**

**JOHNSON Hi-Speed
No. 120**

Treat high speed steels

Harden high carbon steels

Braze carbide tipped tools

\$14550

F.O.B. Factory

Compact, powerful, and remarkably economical in operation. JOHNSON Hi-Speed No. 120 reaches 1500°F. in 5 minutes. Delivers 2300°F. in 30 minutes. Easily regulated. Holds temperature at desired level for accurate heat-treating any steels: Ideal for small metal parts. Gets the job done fast to save time and gas. Firebox 5x7 $\frac{3}{4}$ x13 $\frac{1}{2}$. Complete with Carbofrax Hearth, G.E. Motor and Johnson Blower. Order Today.

There is a Quick-Acting JOHNSON Unit for every toolroom and shop

WRITE FOR FREE CATALOG

**JOHNSON GAS APPLIANCE CO.
370 E AVE. N.W., CEDAR RAPIDS, IOWA**

ABRASIVE METAL CUT-OFF MACHINE

An ingenious abrasive metal cut-off machine, designated as the "Swing-Cut" unit, has recently been placed on the market by the Stone Machinery Co. The new machine stresses flexibility, operator safety and ease of operation.



The unit's capacity extends to cuts up to 3" bar stock and 4" tubing in both ferrous and non-ferrous metals. This is obtained by a 5 h.p. geared-in-head induction-type motor, eliminating the customary belt drives. This construction innovation is claimed to produce more work with the 5 h.p. motor than the average 10 h.p. motor would accomplish with v-belt drive construction.

High speed cutting reduces the possibility of metal burn, and does away with the necessity of wet cutting in many materials. The wheel spindle speed is 2380 r.p.m. The rigid construction of the machine as well as the positive holding characteristic increases wheel life and accomplishes straight cuts to close tolerances with a minimum of burr.

A rapid-action self-centering vise, adaptable to most contours and shapes is mounted on an adjustable swivel plate, calibrated in degrees. This important feature, illustrated above, provides for a fast change from straight or 90° cutting to any desired angle.

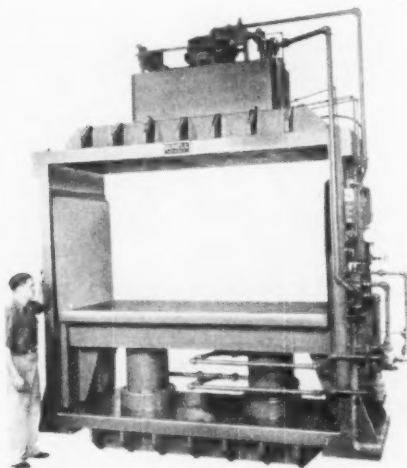
A waist high work level cuts down operator resistance; the machine's safety factors, combined with ease of operation, results in less operator fatigue. The

balance of the machine head is accomplished through spring load control, rather than by counterbalancing weights. The Stone Abrasive Metal Cut-Off Machine requires a floor space of only 30" x 48"; standard equipment includes arbor flange and nut, wrenches and grease. Made by **Stone Machinery Co., Inc.**, 339 Fayette St., Manlius, N. Y.

BUNELL UNIVERSAL HYDRAULIC PRESS

A flexible design which is adaptable to a wide range of requirements, and low operating costs are features of the new Bunell Universal Hydraulic Press. A wide variety of testing and production jobs can be handled on this new unit.

Individual customer specifications on die space, die opening, stroke, pressure and number of hydraulic cylinders can easily be met. The press can handle such diversified work as die spotting and tryout, blank development, straightening, molding, laboratory tests, assembly under pressure, and many other jobs.



Very light or very great pressure capacities can be "built-in" to individual presses. Finger-tip control for regulating the final pressure required makes the press safer and easier to operate. Fast approach and slow movement of the ram for the last portion of the stroke allows better control and decreases the possibility of breaking the die. Two-way hydraulic cylinders are used, so that pressure can be applied in either direction of the ram movement.

Accessibility, convenience and safety in operation are other advantages of the

BARGAINS! LONG DRILLS

9" FLUTE

12" HIGH SPEED 12"

Size	Price Each
1/8" x 12"	\$1.71
9/64" x 12"	1.71
5/32" x 12"	1.71
11/64" x 12"	1.71
3/16" x 12"	1.71
13/64" x 12"	1.82
7/32" x 12"	1.82
15/64" x 12"	2.00
1/4" x 12"	2.00
17/64" x 12"	2.12
9/32" x 12"	2.12
19/64" x 12"	2.29
5/16" x 12"	2.29
21/64" x 12"	2.59
11/32" x 12"	2.59
23/64" x 12"	2.88
3/8" x 12"	2.88
25/64" x 12"	3.17
13/32" x 12"	3.17
27/64" x 12"	3.47
7/16" x 12"	3.47
29/64" x 12"	3.76
15/32" x 12"	3.76
31/64" x 12"	3.76
1/2" x 12"	3.76



DIAMONDS

BARGAIN PRICES

KNOWN FOR THEIR PRECISION AND DEPENDABILITY.

SAVE WITH EASTERN

Dress your wheels accurately with long lasting diamonds. Specify holder or nib required. No extra charge.

Carat	Price Complete
1/4	\$2.95
1/2	3.95
3/4	7.00
1	8.95
1 1/2	12.00
2	15.00
3	25.00
4	35.00

Send for Free Catalog 128 pages

EASTERN TOOL SUPPLY CO.
174 Grand St., N. Y., N. Y.

Bunell Universal Hydraulic Press. The controlled downward movement of the ram makes it possible to stop at any desired working height. The complete press requires little space, and all parts of the press and hydraulic mechanism are accessible for maintenance.

Maximum strength and minimum deflection are assured by the ribbed construction of the frame and ram. Two protected slides and no other bearings reduce the chance of scoring the ways with emery dust in die spotting operations. Long slide surfaces of the ram and adjustable gibs prevent binding due to uneven conditions in the die at the start of contact, and increase the working life of wear surfaces. The unit is made by **Bunell Machine and Tool Co.**, 1601 E. 23rd St., Cleveland 14, Ohio.

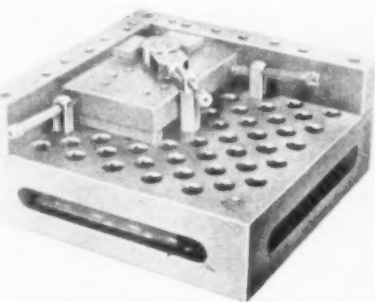
DRILLING PLATE ELIMINATES NEED FOR JIGS

The Universal Drilling Plate, designed to eliminate costly jigs and fixtures in drilling and reaming accurately spaced holes, has recently been introduced.

Simple in its set-up, the Drilling Plates' clamps hold the work accurately against side rails. Gage blocks and the Master Drill Disc then locate the po-

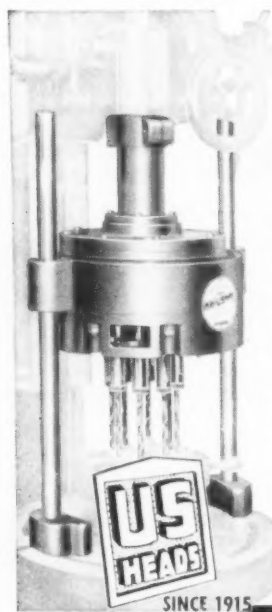
sition of the hole. At no time is it necessary to remove the work in order to drill. All holes are located simply by using the proper accurate gage blocks.

The results obtained through the use of this plate are as accurate as the gage



blocks will permit. The master disc gage is made of tool steel, hardened, ground and lapped to .00006". The disc gage hole is tapered for quick removal of the bushing.

The Universal Drilling Plate is manufactured by **Montgomery & Co.**, 53 Park Place, New York 7, N. Y.



Designed for You!

ADJUSTAFIX MULTIPLE SPINDLE DRILL HEAD

This head is designed to reduce drastically multiple drilling costs by eliminating expensive changes in set-up from job to job.

As much as 90% of the drill head can be left intact, yet a complete engineering change-over is accomplished by simply changing the drill pattern plate and relocating spindles on the new pattern plate to conform to the new design.

The spindle and idler constructions are entirely separate assemblies both being self contained. For this reason, the use of compound gears on the idler shaft gives exactly the tool speed required for a given job. No change of gearing is necessary in the main drive box when tool speed is changed.

THE ADJUSTAFIX MULTIPLE SPINDLE DRILL HEAD can be easily installed on the machines you are now using, and can be used not only for drilling, but for tapping, reaming, spot-facing, boring, counterboring, and milling operations as desired.

ALL ADJUSTAFIX MULTIPLE heads have fully automatic lubrication for either horizontal or vertical operation.

UNITED STATES DRILL HEAD CO. 616 Burns Street,

CINCINNATI 4, OHIO

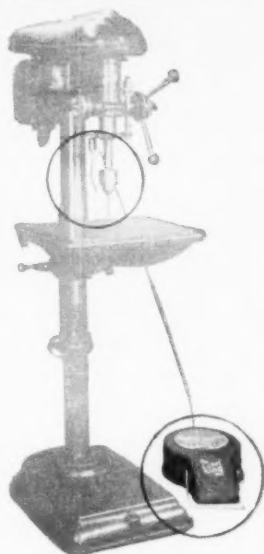
We manufacture all types of multiple spindle, fixed center, adjustable, and lead screw tapping heads.

THE LUBRI KING UNIT FOR DRILL PRESS OR TAPPING MACHINE

The Lubri King Unit is a sturdily constructed device which can be adjusted to the shaft of a drill press or tapping machine for the purpose of supplying coolant or lubrication to the machine. According to the manufacturer, the Lubri King unit puts the lubricant where and when the operator needs it, and allows as much or as little as needed. There is no waste of coolant by constant flow when the tool or drill is not actually in cutting process. Pressure on the foot pedal causes the lubricant or coolant to be applied instantly to the work, leaving both hands free.

The tank or reservoir of the Lubri King unit is deep drawn from 20-gauge steel. The foot pedal is a one piece stamping, $\frac{1}{8}$ " thick, twisted and formed to suit. The 5-foot plastic hose was selected because of its resistance to oil. The fittings are brass, firmly crimped to the hose. The pump and check valve are also brass. A 6" piece of copper tubing is used for a nozzle, and is attached to the drill press by means of a bracket. The nozzle travels up and down with the tool or drill. No return is provided to bring the coolant back to the tank, since only as much lubricant is applied to the cutting tool as is actually used.

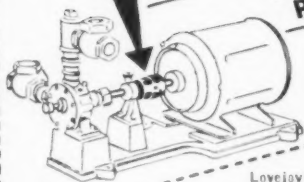
Occasionally a heavy object or work piece is accidentally dropped on the Lubri King unit; it is built to withstand heavy abuse. The lubricant or coolant is poured into the unit through a 50 mesh screen which may be removed to clean or replace. The unit's capacity is 2 gallons. The Lubri King is made by W. A. Horejsi Co., 2001 James Ave., North, Minneapolis 11, Minn.



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**INCREASE EFFICIENCY AND
PRODUCTION OF YOUR EQUIPMENT WITH**

**LOVEJOY
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FLEXIBLE
COUPLINGS**



Lovejoy L-R
Type "A"
1 1/2 to 50 h.p.
Pat. & Pats. Pend.

Simplest, most dependable correction for misalignment, vibration, backlash. Compact. Resilient. Durable. Non-lubricated. NO SHUTDOWNS FOR CHANGING CUSHIONS. Most economical couplings made!

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LOVEJOY FLEXIBLE COUPLING CO.

Mfrs. also of Lovejoy Variable Speed Transmissions, and Lovejoy Universal Joints.

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CHICAGO 44, ILL.

WARNER & SWASEY OVERHEAD THREADING ATTACHMENT FOR TURRET LATHES

An overhead threading attachment which speeds single-point chasing operations in non-ferrous metals is now available for Warner & Swasey Universal Turret Lathes.

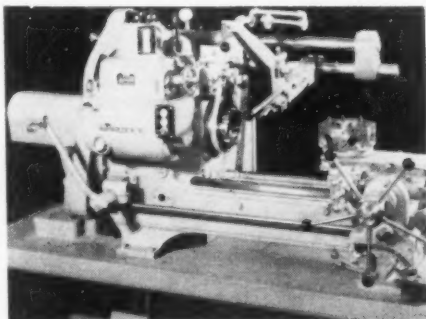
The attachment is mounted at the rear of the turret lathe headstock and extends a screw-adjustment slide tool holder to the right of the spindle. A fixed overhead bar supports a counter-weighted chasing bar on which a guide arm and the chasing tool arm are located.

When the chasing tool arm is lowered, a follower at the headstock end of the chasing bar engages a leader driven by gears from the spindle to move the bar and attached tool longitudinally in accordance with the pitch of the leader-follower combination chosen. An adjustable bracket fixed to the head of the machine provides a slide on which the guide arm rests for positive guiding of the chasing tool. The slide may be tilted so that a pipe thread can be cut.

The chasing tool arm can be located anywhere along the chasing bar, and the threading length which can be cut at one time is $4\frac{1}{4}$ ".

At the end of the desired threaded length, the operator swings the chasing

arm up, lifting the tool from the work, the chasing bar counterweight keeping the arm in a raised position. A compression spring returns the chasing bar longitudinally to its original position for the cut or the next piece.



A brake is also furnished to be attached to the headstock with a belt loop which surrounds the chuck, to further speed the cycle. The attachment is made by The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

HIGH SPEED PRODUCTION CONTINUOUS OIL GROOVING

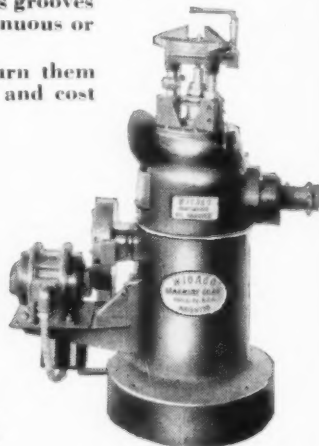
WICACO CONTINUOUS OIL GROOVER cuts grooves of all descriptions, internal or external, continuous or intermittent.

Send us samples for grooving. We will return them cut to specifications, with a record of time and cost estimate. No obligation.

*Ask For Descriptive Booklet And See How
You Can Improve Your Production.*

WICACO
MACHINE CORPORATION
WAYNE JUNCTION, PHILA. 44, PA.

*Manufacturers of
Precision Machinery and Machine Parts
Roller Bearing Twister Spindles—Spindle
Oiling Machine—Precision Internal Grind-
er—Screw Machine Products*

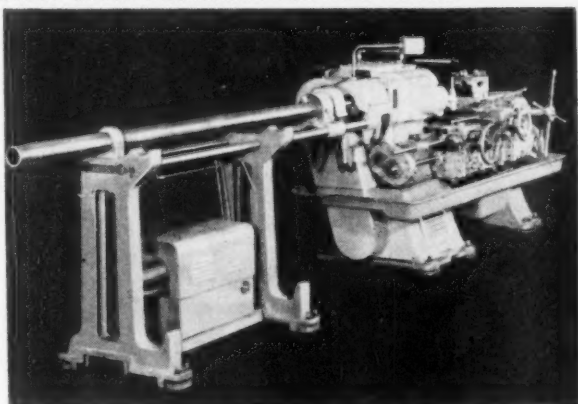


BAR FEED AND COLLET CHUCK MECHANISM FOR J & L LATHES

A new Hydraulic Bar Feed and Collet Chuck Operating Mechanism for Jones & Lamson Universal Turret Lathes has been introduced.

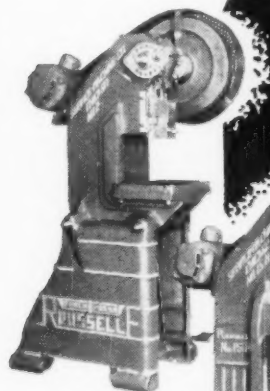
High speed turning with carbide intensifies the need for a bar feed and collet chuck mechanism that can be operated continuously at high production rates without exhausting the operator. The new Jones & Lamson Bar Feed and Collet Chuck Mechanism goes far toward eliminating this problem in turret lathe bar operation.

With single lever, finger tip control of the complete operating cycle, the operator's energy is conserved, and his production is consequently increased. This mechanism can be installed on any Jones & Lamson No.

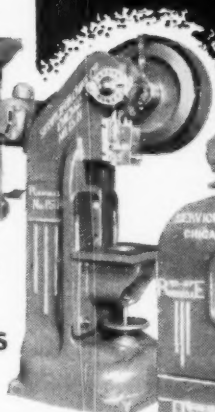


3, 4, 5, 7 or 8 Universal Turret Lathe, either at the factory or in the field.

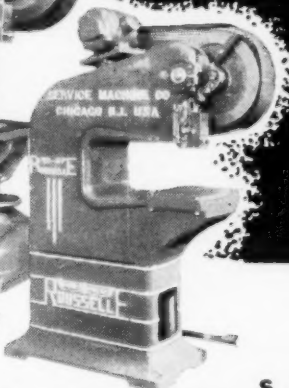
Complete details can be supplied upon application to Dept. 710, Jones & Lamson Machine Co., Springfield, Vermont.



O.B.I. PRESS



HORN PRESS



DEEP THROAT

EFFICIENT — LOW COST PRODUCTION

MEANS

ROUSSELL

**PUNCH
PRESSES**

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SERVICE MACHINE COMPANY

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Accuracy of measurement depends on the precision of the measuring tools. Provide your Shop and Inspection Department with dependable and proper Inspection Tools. MEEHANITE METAL TOOLS, made to close tolerances, are furnished in many types:

Surface Plates - Box Parallels
Slotted Angle Plates
Universal Right Angles
Flat Parallels - Lapping Plates
Toolmakers' Knees - Straight Edges
Masterangle Plates - Angle Attachments

Send for Bulletin

WE RESCRAPE SURFACE PLATES
LIKE NEW

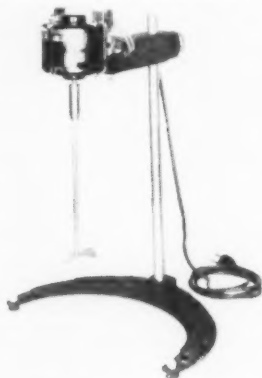
ACME TOOL CO.

71 W. Broadway

New York 7, N.Y.

UNIVERSAL CHEMICAL STIRRING MIXER

A universal Stirring Mixer for all fluids, including oils, chemicals and other such solvents will handle quantities in a satisfactory manner from one quart to five gallons. The mixer is provided with a standard a.c. 110 volt Underwriter's approved motor with on-and-off switch.



All parts are fully rustproofed with stainless steel shaft and mixing paddles, eliminating probable rusting and corrosion. The overall height is 15", with two sizes of non-corrosive stainless steel shaft paddles. It has an adjustable over-ram for any height, and the mixing unit may be moved through an arc of 45°. A general utility supporting clamp is provided for clamping to vats, tanks and other large containers. The Universal Stirring Mixer is made by **Dayton Rogers Manufacturing Co.**, Minneapolis 7, Minn.

PRECISION HAND TAPPING MACHINE

A new Hand Tapper, the model H. T. 250, is a bench type machine designed for sensitive, precision small hole tapping. It is primarily intended to be used by tool and die shops, school and service shops, experimental departments, light assembly production plants, etc.

The Hand Tapper insures accurately tapped right angle holes. Reduced tap breakage and increased tap life are the result of this guided accuracy. Four collets, which handle standard tap shank sizes and taps from No. 0 through 1/4", are supplied with each machine. The collets, it is claimed, provide positive drive-through, due to square socket and shank design. A knurled threaded collar (removable by hand) holds and centralizes the collet and tap. Either right or left hand taps may be used.

The adjustable spindle arm swings to right or left and may be quickly positioned for height. The maximum dis-



tance from machine base to bottom of tap is 6". Two clamps for holding the work to the base are adjustable for

various job applications. They also equalize tap torque. Spindle is provided with extra long bearing to insure rigidity and long life. Ball and spring tension against the spindle prevent spindle from falling to low position. All parts are machined from grey iron castings and machinery steel. Collets and threaded collar are hardened for long life. Made by **H. D. Herder Tool Specialties Co.**, 2424 Brook Drive, Kalamazoo, Mich.

POWER HACK SAW BLADE

The "Red Rocket" is a new power hack saw blade which has been added to the line of metal cutting saws manufactured by the **W. O. Barnes Co., Inc.**

The new blade is highly recommended for production work. It is capable of withstanding heavy feeding pressures because of its flexibility and toughness. These characteristics offer many production and safety advantages with the shock loads that constantly occur under production cutting conditions. The qualities of flexibility and toughness are the result of months of research involving new equipment and processing techniques. **W. O. Barnes Co., Inc.**, 1297 Terminal Ave., Detroit 14, Mich.

TAP NO. 2-56 TO 3/8" IN STEEL

With only 1 DORMAN TAPPER

* Automatic Reverse and Torque Control

- ... one minute to adjust
- ... prevents tap breakage
- ... no controlled pressure required
- ... operator need not be skilled

* Four Sizes of Dorman Tappers — Tap Capacity No. 2-56 to 2" in Steel

Note wide tap range in each size.

- ... No. 1 Friction Drive Tapper—capacity No. 2-56 to 3/8" in Steel and 1/2" in Aluminum.
- ... No. 2B Positive Tapper—capacity 3/8" to 7/8" in Steel.
- ... No. 3A Positive Tapper—capacity 1/2" to 1 1/4" in Steel, 1/2" to 3/4" pipe taps.
- ... No. 4A Tapper—capacity 3/4" to 2" in Steel including pipe taps.

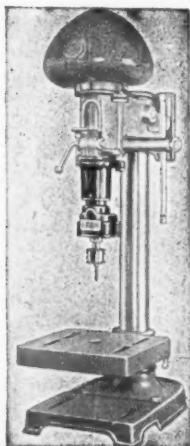
* Efficient Production Threaders with

- ... Round Split ... Button ... Acorn Dies

* Immediate Delivery

* Low Priced ... from \$44.00

* Write today for descriptive literature.



THRIFTMASTER PRODUCTS CORPORATION

Division of Thomson Industries, Inc.

1030 N. PLUM ST., LANCASTER, PA.

Other Products

Universal Adjustable Drillheads

Standard—1/2" Minimum—Centers to 10 3/4" Diameter Circle

Special Fixed Center & Gear Driven Adjustable Drillheads

SAVINGS UP TO 50%

THROUGH INCREASED
LATHE AND
MAN-HOUR OUTPUT



- DEEPER CUTS
- FASTER SPEEDS
- HIGHER ACCURACY
- NO GOUGING OR BURNING

IDEAL LIVE CENTERS

For Light or Heavy Turning

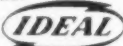
Users report savings up to 50% with quality and accuracy of work markedly improved. Spoilage and overheating both eliminated. IDEAL Live Centers are permanently accurate due to special bearing seal, short overhang and unique bearing arrangement that gives maximum rigidity. Available in all standard sizes. "Multi-Duty" for male, female and pipe-type points. "Heavy-Duty" for big jobs — accurate to .0005".

OTHER PRODUCTION SHORTCUTS
Available from your Ideal Distributor
Electrical Etchers • Tachometers
Demagnetizers • Dust Collector



CLIP AND MAIL TODAY

IDEAL INDUSTRIES, Inc.
1441 Park Avenue
Sycamore, Illinois



Please forward catalog information on Live Centers and other production short-cuts.

NAME _____

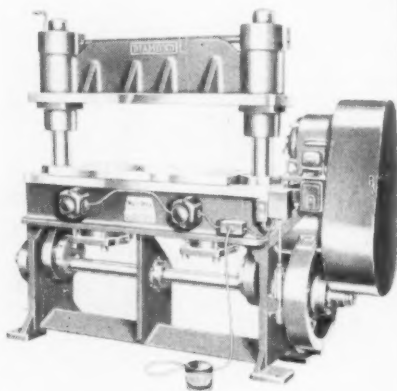
COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

DOUBLE CRANK PUNCH PRESS

Added to the Diamond line of double crank large bolster area punch presses is the Model 3036 Multi-Max Punch Press, manufactured by the Diamond Machine Tool Company.



The Multi-Max Punch Press is rated at only 30 tons capacity, yet it combines a large bolster area of 16" x 36" and a ram area of 10" x 36". Because of the large bolster area combined with the speed of the press, which is 80 strokes per minute, a wide variety of metal stamping operations is made possible economically. The picture illustrates the installation of two 8-inch pneumatic draw die cushions and an electrically operated solenoid clutch mechanism with hand-operated dual push button safety switches and remote control foot switch.

The Multi-Max punch press is of all steel weld construction with a 4-point engaging clutch. Standard stroke is 2", and maximum stroke to order is 4"; the ram adjustment is 2". The press is single geared with precision herringbone gear design. The crankshaft is 3" in diameter and is heat treated, ground, and polished. The motor required is 3 h.p., 1800 r.p.m. The standard shut die height is 10", with maximum to order 24". **Diamond Machine Tool Co., 3429 E. Olympic Blvd., Los Angeles 23, Calif.**

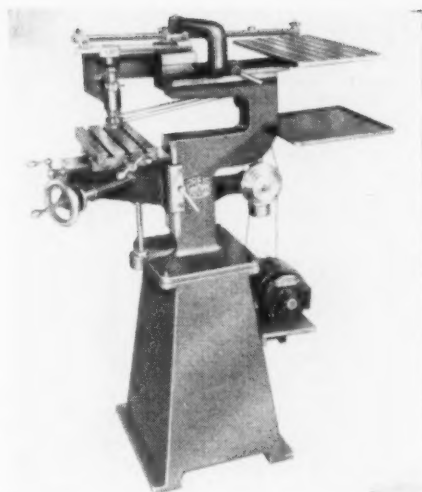
PANTO-ENGRAVER HAS HIGH CAPACITY RANGE

A new Panto-Engraver for general two-dimensional engraving as on name plates, large panels, steel dies and stamps, and similar objects, is introduced. It is of rugged design, capable

of engraving and profiling in steel dies and molds; the open throat permits engraving to the center of a 30" diameter dial or 30" wide panel. Pantograph ratios range from 1:1, or full size, to infinity. The Pantograph, cutter spindle and spindle links are mounted in precision angular contact ball bearings. They assure accurate assembly and easy adjustment for play or normal wear, resulting in great ease of movement for delicate and precise reproductions at all ratios. Six cutter spindle speeds range from 5000 to 14,000 r.p.m., powered by a 1/4 h.p., 1725 r.p.m. motor.

The standard work table is 6" x 12", with three tee slots; an auxiliary work table 18" x 24" with four tee slots is available for engraving large panels or dials. The maximum work height is 6", cross feed 6", and longitudinal feed 6 1/2", with all dials graduated in .001". The cutter spindle is of a collet design and collets are available from 1/10" to 1/4" diameter for straight shank cutters in addition to the collet for standard tapered shank cutters.

It can be furnished either as a bench model or floor model as pictured. The floor model is 50" high and weighs approximately 365 lbs.; the bench model is



28" high and weighs approximately 300 lbs. The unit is made by **H. P. Preis Engraving Machine Co.**, 651 State Highway 29, Hillside 5, N. J.



No. 10



No. 11



No. 12



No. 13



No. 14

Again FIRST with the FINEST

This new laboratory graded MICRO fine diamond powder has half the particle size of our famous No. 10. It will produce

MICRO MIRROR FINISHES

hoped for but never before possible on the hardest metals. . . .

IN MINUTES INSTEAD OF HOURS

Truly the Miracle of this Precision Age.

Foolproof . . . Economical

Tested and Proven

Our field engineers cover most of the country.

Write us today for a demonstration.

A-1 ABRASIVE LABORATORIES, INC.

139 DUANE ST., Diamond Building

New York 13, N.Y.



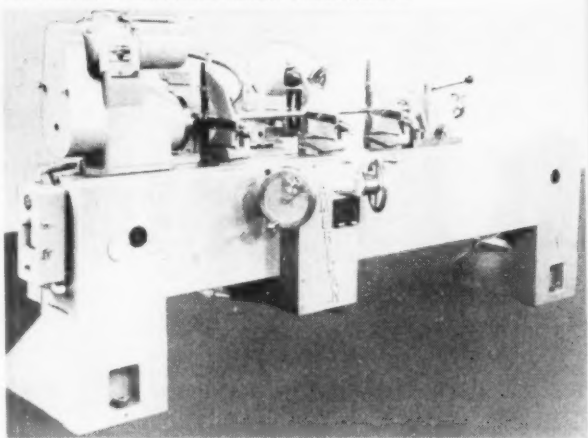
NEW METHOD OF BROACH RESHARPENING ANNOUNCED

A new type of cylindrical broach-resharpening machine incorporates the advantage of mounting the broach between centers on a stationary bed and traversing the grinding wheel from tooth to tooth for faster and more accurate resharpener.

This new unit, which was in the development stage and trial period for two years, can be used to resharpen internal broaches, such as involute and helical splines, hexagon, can shaped, irregular formed, serration and combination types.

One of the principal features of the new method is the reduction in floor space, due to the stationary bed mounting for the broach, thus eliminating the over-travel on the ways, usually a standard practice on conventional models.

Outstanding features of the new unit include: micrometer dial control wheels



for the lateral traverse of the carriage and infeed of the grinding spindle; variable speed drive for the rotation of the broach; anti-friction bearing rollers and hardened and ground carriage mounting rails.

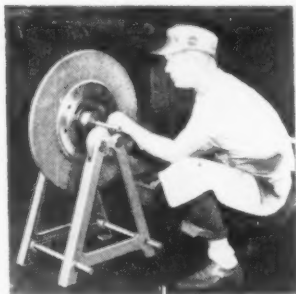
Use *Anderson* BALANCING WAYS No Leveling Required

With Anderson Balancing Ways it is easy to balance any rotating object in a fraction of the time formerly required by other methods. Simply place the Ways on the floor or bench and they are ready to use without adjustments of any kind.

The revolving, chilled iron discs and the spindles, are ground and balanced to extreme accuracy. Spindle bushings are hardened—glass hard—yet without danger of breaking. This eliminates the possibility of wear or ball bearing indentations on spindles or bushings when heavy weights are placed on the ways.

They save time, save labor, and assure better work.

Write for Bulletin No. 1-5



Swing	Between Standards	Capacity in lbs.
20 in.	20 in.	1,000
40 in.	30 in.	2,000
60 in.	30 in.	2,000
72 in.	66 in.	5,000
96 in.	88 in.	10,000



ANDERSON BROS. MFG. CO., Rockford, Ill.

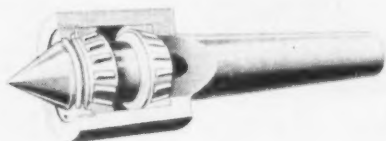
Balancing Ways, Roto Checkers, Hand and Power Scrapers, Spotters, Hand and Power Hydraulic Straightening Presses.

Two model sizes are available for the resharpener of round type broaches: the RBS-9-84 for broaches up to 9" in diameter and up to 84" in length, and the RBS-9-60 for broaches up to 9" in diameter and 60" in length. The new units are a product of **American Broach and Machine Co., Ann Arbor, Mich.**

NEW LIVE CENTER HANDLES HEAVY LOADS

Heavy loads at high speeds (required when using carbide-tipped tools) can be handled with high accuracy in lathes and other machines by using the new Scully-Jones Live Center, according to its makers. A product of simple design and exhaustive development and testing, this live center stresses economical and accurate operation.

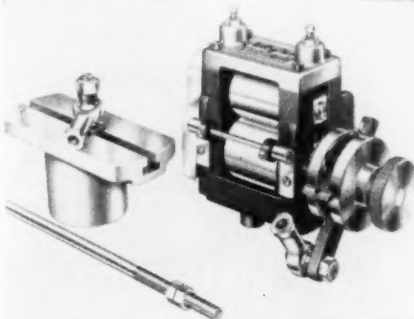
Two matched Timken tapered roller bearings with eccentricity points aligned for perfect anti-friction rotation provide a large bearing surface to withstand shock loads and abuse, assuring longer life and high load-carrying capacity up to 1000 lbs. in the No. 2 and 3 Morse taper sizes, and up to 2400 lbs. in the No. 4 and 5 Morse taper sizes.



A threaded retainer ring to preload bearings provides rigidity as well as adjustment for wear. The alloy steel spindle is hardened to 64 Rockwell "C". The point is ground in its own bearings after assembly in order to guarantee holding runout to within .0002" of total indicator readings. The shank induction is hardened for maximum strength and resistance to wear, and is precision ground for a perfect fit.

A heavy-duty grease seal is incorporated in the threaded retainer ring. A rotating neoprene ring forms an efficient labyrinth seal against the entrance of grit or chips. The grease port with a $\frac{1}{8}$ " pipe thread in the rear of the shank permits insertions of threaded rod to rotate the spindle when redressing the point. The new center is made by **Scully-Jones and Co., 1907 S. Rockwell St., Chicago 8, Ill.**

A MOST VERSATILE ROLL FEED... \$129⁵⁰



A PRECISION ROLLFEED with Semi-Steel Castings, Hardened and Ground Rolls and Friction Discs. Other sizes priced proportionately low.

Write for Circular

ROLL FEEDS CORP.

148 Middle St. Pawtucket, R.I.

• Builder of ELECTRIX Precision Die Miller •



NEW LIGHT-DUTY HAND GRINDER

The Hobby Tool, a popular-priced, light-weight, yet powerful handgrinder for light industrial applications is announced by The Dumore Company.

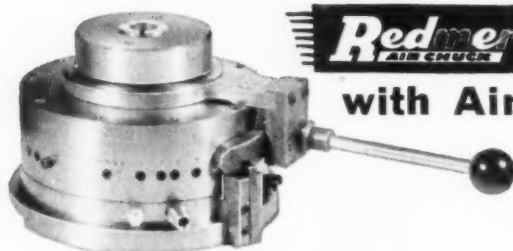


The 1/40 h.p. Hobby Tool runs on 115 volts, a.c. or d.c.; it is said to provide an ideal tool of maximum capacity for light and intermittent bench and finishing work, touch-up work on dies and molds,

on-the-job tool sharpening, etc. It weighs only 12.5 oz. and answers the maintenance and service man's need for a power tool that will fit his tool kit, give him fast drilling, filing, burring, etc., on the job.

Styled in red and black shock-proof plastic, the Hobby Tool features a push-button lock for instant, no-wrench tool change, a handy thumb switch for split second control, and correct shape and balance for ease in handling as well as reduced operator fatigue. A two-piece cast housing eliminates long tie-rod distortion. All major parts are mounted in one half of the housing for easy cleaning or repair. Positive alignment of all parts, preadjusted bearing pressure, machine-wound armatures and fields and quadruple baking of varnish-dipped armatures and field windings are among the device's construction features.

The Hobby Tool is available in two kits: the DeLuxe, in a steel box, with 50 accessories, and the Standard, in an attractive carton with 2 accessories. It is made by **The Dumore Company**, Racine, Wisconsin.



RC-5

Redmer
AIR CHUCK

Index Chuck with Air Operated Collet

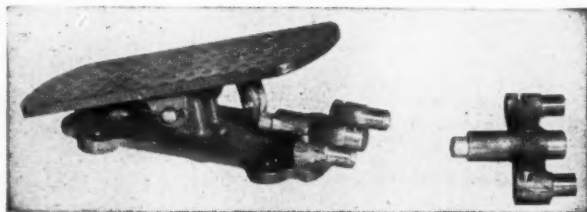
The REDMER INDEX CHUCK has twelve indexing positions and Collet capacity 1/16" to 2". REDMER CHUCK can be had with either Index Collets or Standard Brown & Sharpe type collets.

No. FC-28

V-29

Air Foot Control and Valve

The REDMER FOOT CONTROL & VALVE was developed in order to meet a demand for an AIR VALVE & FOOT CONTROL LOW IN COST but constructed to surpass the high priced Valves.

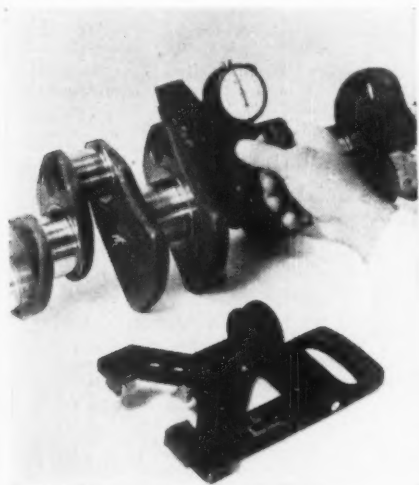


REDMER AIR DEVICE CORP.
GUNTERSVILLE, ALABAMA, BOX 247

DIAL SNAP GAGE FOR CLOSE SHOULDER CHECKING

The illustration below shows an automobile crankshaft being checked with a Nilco Dial Snap gage. This is a typical application for this type of gage. It features the new radius guides adapted to the Nilsson Gage Co.'s standard dial snap gage for checking parts with fillets, or where close shoulder checking is necessary. This standard Snap Gage is equipped with upper and lower radius guides attached to the frame. These guides clear the maximum fillet and permit the gage to check as close as necessary to the fillet. This will detect any hour-glass condition or oversize fillet resulting from the breakdown of the grinding wheel when grinding.

It is possible to apply this dial snap gage to the work and obtain a repeated



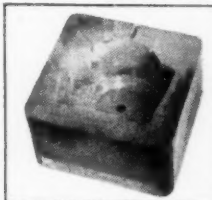
reading quickly without rocking the gage back and forth. This gage is specifically designed for checking crankshaft grinding on the machine. It is very light and portable and has an indicator in graduations of .0001". Because of the patented Nilco rotatable assembly, it is possible to extend the indicator back away from the work to clear any eccentric throw that might interfere with the gage.

The device is made by Nilsson Gage Co., Box 505, Poughkeepsie, N. Y.

SMASH! HEAT TREATING PROBLEMS SLASH! HEAT TREATING COSTS

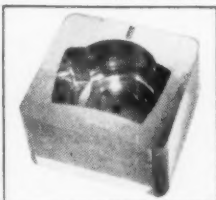
with... PHOENIX BRAND NON SCALING COMPOUND

Originally produced for use in Parker's own plant to prevent scale formation and decarburization during heat treatment of tools and dies, PHOENIX BRAND NON-SCALING COMPOUND proved so successful it is now being offered commercially to industry. Not a salt solution but a specially compounded powder for use in hardening and annealing of steels — tested and proven in hundreds of hardening rooms, PHOENIX BRAND NON-SCALING COMPOUND pays its way in time and money saved. Obtain increased furnace capacity and production! Recommended for steels hardening up to 1750 F. and for use in all furnaces except bath type. TRY IT . . . discover for yourself the amazing results obtained in time and money saved using PHOENIX BRAND NON-SCALING COMPOUND.



This can be prevented! Note scale, pitting and decarburization . . . a result of normal heat treating. Time can be saved, furnace production increased, costly polishing after heat treating can be virtually eliminated.

ORDER FROM MILL
SUPPLIER OR WRITE
TO ADDRESS BELOW



This unretouched photo shows clean, smooth surface after heat treating using PHOENIX BRAND NON-SCALING COMPOUND. You too can benefit in time and money saved, eliminate scale, pitting and decarburization.

A Product of:

Parker

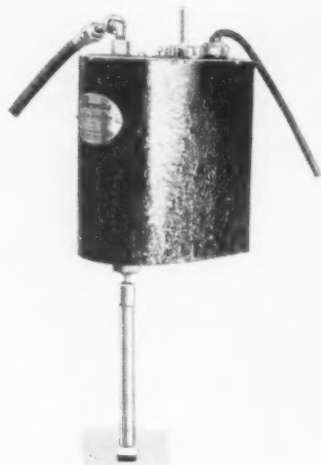


THE PARKER STAMP WORKS, Inc.
Established 1871
HARTFORD, CONNECTICUT

NEW TAP REMOVER AND METAL DISINTEGRATOR

The 1950 Thomas Metalmaster Junior, a new, self-contained metal disintegrator, has just been announced by the Clinton Machine Company. "The new Metalmaster Junior reaches a new high in cutting qualities per dollar spent," Don Thomas, Clinton Machine president, declared in making the announcement. "It's extremely compact, easily handled and may be attached and operated on any standard drill press. Most frequent uses for this product are for removing taps, drills, etc. from holes without distorting the threads, and for cutting shaped holes in dies," Mr. Thomas explained.

The disintegrator is operated by chucking it up in a drill press, selecting the proper size electrode, turning it on, and letting the disintegrator, with its self-feeding feature, do the rest. The device will remove broken taps from .080" to 1", and is used to take out any broken tools, taps, studs, reamers, pins, plug gauges and drills. Hole shapes which it will cut in carbides or any hardened metals include rounds, elongated holes, open squares, blind squares, hexagonals and pinion shapes.



The 1950 Metalmaster Junior is manufactured by the Clinton Machine Co., Clinton, Mich.

Dependable MEASURING & CHECKING EQUIPMENT

and Now

HAND WHEELS, KNOBS, HANDLES

Cadmium Plated

Non-rusting — good looking

READY
TO
DELIVER



STRAIGHT and OFFSET TYPE



CAST IRON



**SOLID ROTARY
MACHINE HANDLES**



MALLEABLE IRON

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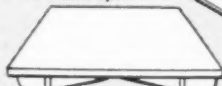
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NEW RESPIRATORS HAVE INTERCHANGEABLE FILTERS

A new line of twin cartridge respirators specifically developed to provide protection against seven respiratory hazards through a basic face piece and seven interchangeable filters is announced by American Optical Company.



Describing its new R5000 respirators as "the most versatile of their kind," the company states that the seven filters protect workers against (1) a combination of all toxic and nuisance dusts, (2) organic vapors and gases, (3) acid gases, (4) combined acid and organic gases, (5) low concentrations of ammonia (6) combination of organic vapors and all dusts, and (7) metal fumes from welding, burning, smelting or refining operations.

In effect, the company adds, the new development gives a user seven respirators in one through the seven interchangeable filters which can be quickly screwed into the respirators' twin filter holders. This feature eliminates the expense of stocking seven types of respirators for workers needing protection against common industrial respiratory hazards.

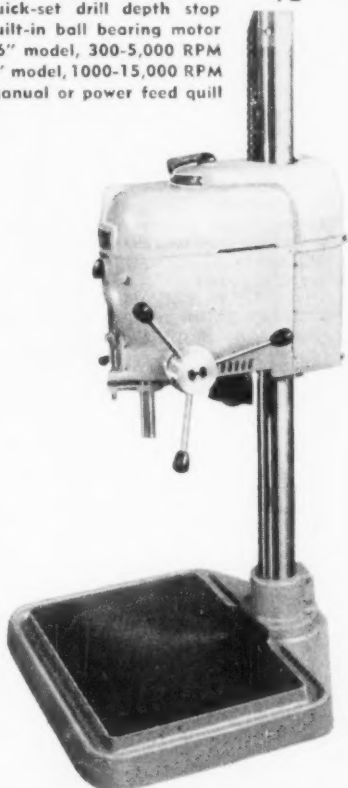
The basic face piece of the new respirators is molded from durable rubber and has a new "rolled" edge that curves inward to give a snug fit without leakage. Other features include a flexible fitting brace for shaping the respirators to individual features, an efficient inhalation and exhalation system and increased field of vision through thinner filter cartridges. American Optical Co., Southbridge, Mass.

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Fingertip variable speed
Sensitive precision spindle
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8" model, 1000-15,000 RPM
Manual or power feed quill

.004"
to
1/2"



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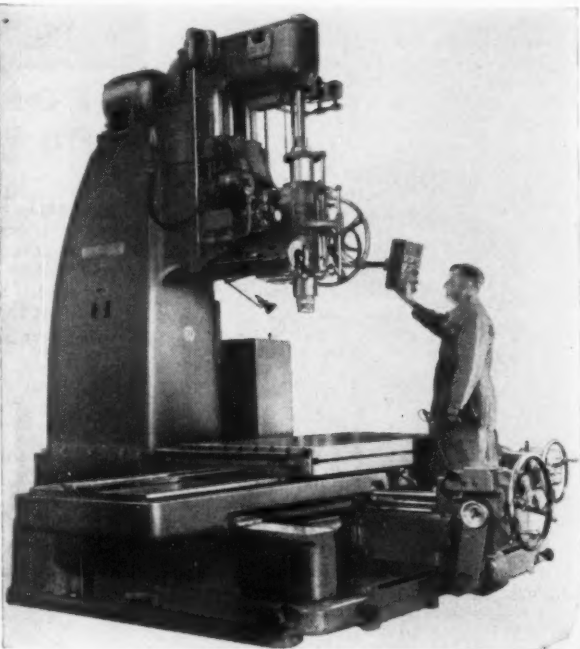
LARGE P & W VERTICAL TYPE JIG BORER

Pratt & Whitney have added a new larger-size Jig Borer to their present line. It is stated to be the largest vertical type Jig Borer ever built, and is capable of locating and boring to .0001" accuracy with a work load of 2½ tons. The new 15-ton precision machine is the No. 4-E, and its open-side construction provides convenience in placing and holding a wide range of work.

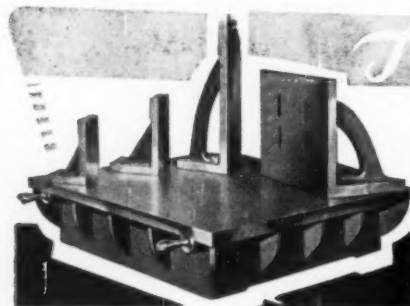
The standard No. 4-E Machine has a 36" x 72" rectangular table with longitudinal travel of 60" and transverse travel of 36". The maximum standard height from table top to spindle nose is 33"; however, columns 6", 10" and 14" higher than standard can be furnished, increasing the vertical capacity to a maximum of 47". A combination rectangular and built-in 42" diameter rotary table, or a built-in 48" rotary table, can be furnished in place of the plain rectangular table.

Tools, as large as No. 5 Morse taper, are held in the spindle with collets and a spindle nose cap. The 5½" diameter hardened, ground and lapped quill has a 10-inch vertical travel with power feeds (both up and down) ranging from .0005" to .015" per revolution of the spindle.

Electrical controls of the primary functions of the machine are concentrated in a pendant control station which is located at the normal operating position



and is adjustable to suit operating conditions. Push-button controls and selector switches include: spindle motor speed selector; spindle start, stop and reverse; spindle clutch and brake; spindle head, vertical power movement with automatic clamping and unclamping; longitudinal rapid power travel of table for quick positioning; carriage and table power milling feed selector giving full range from 1 to 15 inches per minute.



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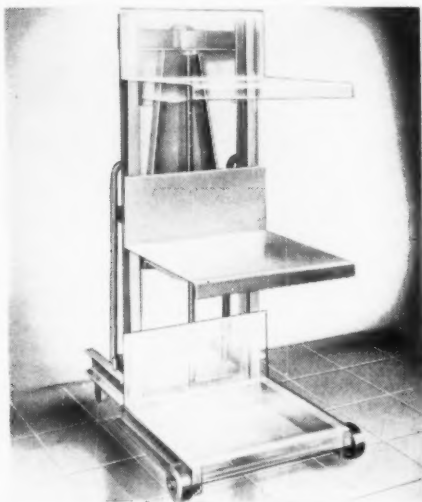
In addition to the pendent controls, push-buttons are also located on both carriage and table control brackets for controlling rapid power travel when positioning work in both longitudinal and transverse directions.

An electric control cabinet is located at the right of the machine, and contains a main disconnect switch, all starters, relays, electronic and other electrical apparatus necessary to the operation of the machine. It is a separate unit and therefore eliminates all possibility of heat transfer into the machine.

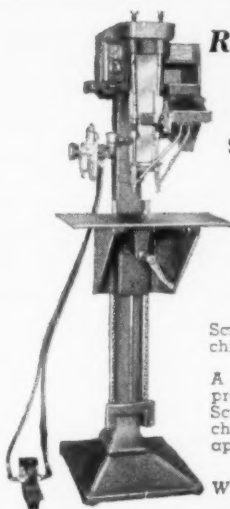
Floor space of the entire machine and control cabinet is approximately 12½ ft. wide by 11 ft. deep. Approximate overall height (using highest column) is 12 ft. **Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford 1, Conn.**

NEW STACKER HAS HALF-TON CAPACITY

The stacker shown below is now offered as a standard unit in the "Portelvator" line of lifting, positioning, and transporting equipment made by The Hamilton Tool Co. It is of fabricated construction throughout, and utilizes the standard patented Portelvator lifting principle. The



load capacity is 1,000 pounds; the maximum height of platform surface from the floor is 58" and minimum is 6". The platform automatically locks at any position stopped, and cannot slip or "settle" under the load. Platform size is 26" wide and 24" from the front edge to the pro-



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Speed up production and reduce costs by driving from 2 to 6 screws at a time with Reynolds Multiple Spindle Screw Driving Machines.

A complete line of production type Screw Driving Machines for every application.

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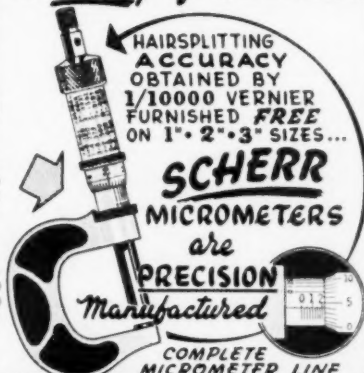
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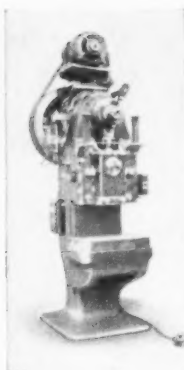


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AUTOMATIC CHUCKING AND INDEXING FIXTURE



- 1.—1800 light cuts per hour.
- 2.—Either horizontal or vertical position.
- 3.—Collets changed instantly.
- 4.—Automatically knocks piece out.
- Model D—Ratchet indexing only—1" cap.
- Model E—Both degree and ratchet indexing
—Capacity up to 1".
- Model F—Both degree and ratchet indexing
—Capacity up to 2 1/4".

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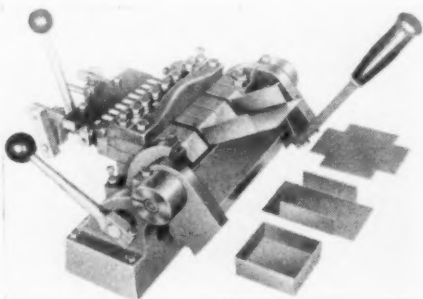
protective back plate. Overall dimensions are: height 70", width 32", length 42".

Platform movement is accomplished through hand crank, roller chain, meshing bevel gears, and screw. This method of power transmission is said to give the platform extra rigidity, and provide the operator with extra safety. Provision is made for extra rapid platform movement under light loads. Equipped with pressure grease fittings throughout, maintenance is said to be extremely low.

The ball bearing casters are 4" dia. x 1 1/2" face and roller bearing wheels are 5" dia. x 2" face. Weight is 328 pounds. **The Hamilton Tool Co.,** Hanover at Ninth St., Hamilton, Ohio.

PRECISION BOX FINGERS FOR DI-ACRO BRAKES

Precision Box Fingers, a new accessory for all Di-Acro Brakes, are announced by O'Neil-Irwin Mfg. Co. The illustration below shows the Box Fingers mounted on a Di-Acro Brake. The manufacturers state that all Di-Acro Brakes



can now be quickly converted to a precision box and pan brake, merely by using the Di-Acro Box Finger Bar in place of the solid top bar supplied with all standard brakes.

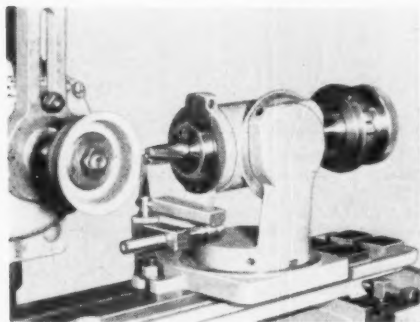
The Di-Acro Brakes, in all four sizes, are available in both standard or Box Finger model, and in either case they retain the same flexibility which allows them to be quickly set for a wide range of operations by simple changes to the bending surfaces.

The new Box Finger accessory is valuable both for experimental and production operations, since the fingers can be quickly adjusted to any size box within their capacity, in graduations of 1/8". Explanatory circular is available from the manufacturer, **O'Neil-Irwin Manufacturing Co.,** 314 Eighth Ave., Lake City, Minn.

CUTTER GRINDING FIXTURE HAS WIDE USAGE

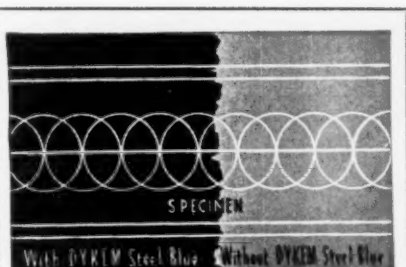
The Universal Cutter Grinding Fixture recently introduced by Rocheleau Tool and Die Company is a versatile grinding tool which may be used on any make of universal tool grinder or surface grinder. The fixture consists of a tool steel spindle and sleeve, hardened and ground for accuracy and long life. The base, angle bracket and spindle housing are made of fine grain cast iron castings, machined for accuracy. The base is graduated in 180°, and may be mounted on either side of the angle bracket. The spindle housing is graduated in 360° for convenience in setting up work.

The picture below shows the fixture set up for sharpening the side of a right hand cut with a right hand spiral fluted end mill. The straight shank end mill is



being held in a draw-in collet. The spindle is standard equipment; it is made to take a No. 5 draw-in collet, size from $\frac{1}{8}$ " to 1" in diameter. One $\frac{1}{2}$ " collet is furnished unless otherwise specified. Additional spindles are available for holding all types of taper shanks.

The set-up time of the fixture on most jobs is very short, according to the manufacturer. The unit is easy to set up and simple to operate. A wide variety of cutters which can be sharpened on the Grinding Fixture include end mills, from the smallest up to 1½" in diameter, with straight shanks; shell end mills to 8" diameter; corner rounding end mills or cutters; T-slot cutters; reamers up to 1" diameter; helical and plain milling cutters; side and face milling cutters; convex and concave cutters; metal slitting saws; gear and sprocket cutters; gear hobs; countersinks of all angles, and many others. The Universal Cutter Grinding Fixture is a product of Rocheleau Tool & Die Co., 650 N. Main St., Leominster, Mass.



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Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed layout lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

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THE DYKEM COMPANY

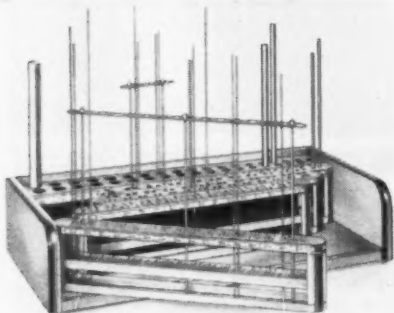
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- Conserve space — it's compact.

HOLDS 20 LETTER 47 FRACTION- AL AND 60 NUMBER SIZES

Each Acro Drill Rod Rack holds 26 letter, 47 fractional and 60 number sizes each indicated with its corresponding decimal size.

Take a look at your present method of storing drill rod and write for bulletin offered below.

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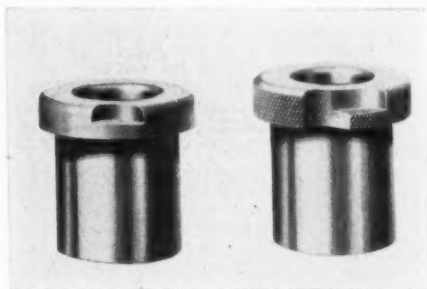
This four-page folder gives complete details of this modern, handy drill rod rack. Send for your copy today — ask for bulletin BB-10.



ACRO METAL STAMPING CO.
338 E. RESERVOIR AVE., MILWAUKEE 12, WIS.

FINE SURFACE FINISH PROLONGS COLONIAL BUSHING LIFE

Extremely fine grain wheels are being used to finish drill jig bushings at Colonial Bushings, Inc. Although use of such wheels means slower finishing, a higher degree of surface finish than customary is being obtained, it is claimed. The fine surface profile is said to have demonstrated increased life by eliminating the irregularities which give wear a chance to start.



The finishing process using these fine grain wheels involves mainly a longer finishing time; there is no loss of stock beyond A.S.A. tolerances. Bushings are absolutely cylindrical as they come off the finish grinder.

Colonial Bushings also has found it advantageous, the company reports, to scrap production gages long before they would be considered "worn out" in most plants. The company produces its own production gages.

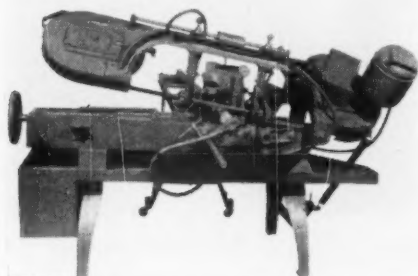
Recently the company has introduced a time-saver for tool engineers working on drill jigs, in the form of a "flip-a-page" catalog. This "catalog" consists of only three sheets of heavy stock, wire bound to lie flat in an open position on the drafting table. All necessary dimensions and specifications of all standard bushings and bushing liners are printed on the inside pages, in such a manner that any data desired—regardless of bushing or liner type—is available by merely flipping the single inside page. Colonial Bushings, Inc., Box 37, Harper Station, Detroit 13, Mich.

WELLS BAR FEEDING DEVICE

An automatic bar stock feeder that converts horizontal metal-cutting band saws into a fully automatic cut-off machine is announced by the Wells Manu-

facturing Corporation. The device, known as the Wells-O-Bar Feed Master, is said to attach easily and without interference with normal operations of the saw.

Projection of material in various sizes and shapes, accomplished by an air actuated (60 to 80 lbs. pressure) spiral roller drive, together with positive air control of the saw frame, during each cutting and resetting cycle, make the multiple cutting action completely automatic.



The maximum length of multiple cuts is 18". Cuts can be made to within 5" of the end of the stock; a safety device trips on the last piece to shut off the feeder.

A roller table track supports the stock and minimizes friction. The height of the unit is adjustable from 24" to 30", and it requires a floor space of only 20" x 72". Net weight of complete unit is approximately 285 lbs. It is made by Wells Manufacturing Corp., 707 Coolidge Ave., Three Rivers, Mich.

Answers to Quiz On Page 128

What Do You Know About Cutters

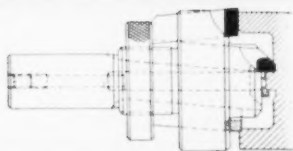
1. True
2. True
3. 10-15 degrees
4. False
5. True

Answers to Question 6

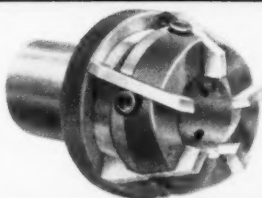
10. Base
7. Flank
2. Face
5. Nose
8. Heel
6. Clearance angle
3. End cutting angle
1. Back rake angle
9. Side cutting angle
4. Cutting edge

GENESEE

COST CUTTING MULTIPLE OPERATION TOOLS



**HOLLOW MILLS - UNDERCUTS - FACES
CHAMFERS - BORES & SPOT DRILLS**



STD. 0-2"
CAPACITIES
H.S.S. or
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10 STYLES

ADJUSTABLE HOLLOW MILLS



STD. 1/4 to 4"
DIAMETERS IN-
TERCHANGEABLE
PILOTS H.S.S. or
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FACING AND COUNTERBORING TOOLS

Let our Engineering Dept. solve your Production Tool problems. Over 40 years of Know How at your disposal.

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GENESEE MFG. CO., INC.
ROCHESTER 4, N. Y.

- ADJUSTABLE HOLLOW MILLS
- FACING AND COUNTERBORING TOOLS
- SPECIAL PRODUCTION TOOLS

BELT OF NEW BELT GRINDER SETS AT ANY ANGLE

A belt grinder, the Expeditor, which can be set at any angle is announced by H. L. Ramsay & Co. The Expeditor is mounted on an axis that centers at the motor shaft, and with one turn of a clamp nut, the abrasive belt can be set at any angle. Several units can be set above each other so that the contact wheels or platens of all grinders may be directly in front of the operator. In this set-up the worker can rough, semi-finish and finish grind with little movement.

With this unit, milling machine operators can deburr, remove cutter marks, break corners, etc. It can be set alongside the metal or wood cutting bandsaws or hack saws to clean up tooth marks, round out contours and deburr; or close to automatic screw machines to remove tool marks and other clean-up operations. It is claimed that the Expeditor can cut costs considerably and increase productivity, since operators can handle these jobs between cycles of the production machine.

There are many plant operations where the Expeditor can be of assistance in speeding work, for instance: in assembling operations, repair and maintenance, metal and wood pattern making, tool making, etc.

The Expeditor is designed for free belt operation; for form wheel work, or contour grinding; for line grinding when much stock is removed; for platen precision grinding either above or below.



It is quickly set up or reset for any such operations.

The unit can be set up over a turn table or moving belt; operations pass be-

NOTCHING TUBING OR PIPE ENDS EASILY WITH

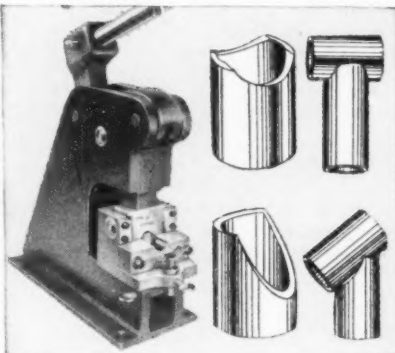
ARC-FIT

Patent No. 2,126,519

IN POWER PRESS OR HAND PRESS

Arc-Fit is a notching unit for preparing pipe or tubing ends in making welded or brazed tubular joints. Arc-Fit will prepare the ends of a pipe or tube in less than 5 seconds. Arc-Fit is a production tool that will cut your production costs. It is applicable in any industry where pipe or tubular construction is used.

- Arc-Fit can be utilized in any power press.
- Arc-Fit can be furnished for any size tubing or pipe.
- A hand press can be supplied with Arc-Fit units for shearing pipe or tubing sizes 2 inches or under.



- For sizes over 2", angular cuts other than 90°, and slotting operations. Quotation furnished on request.
- Arc-Fit does not deform pipe or tube. No grinding or finishing operation is needed.
- Engineers can now design for tubular construction and cut costs.

Write today for circular and prices.

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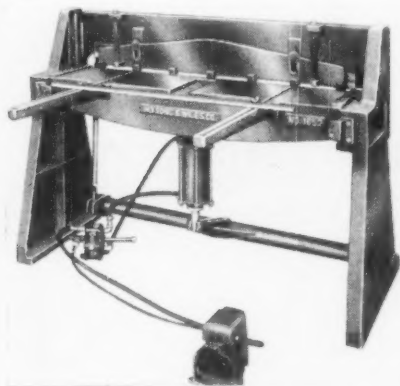
Chicago 47, Illinois

neath to be reduced to proper size, rough ground and finish ground and polished and dropped out automatically.

The front contact roll is aluminum; a drive belt serves as a resilient or cushion. Various densities are available. Resilient contact roll grinding, polishing or sanding is done at a lower cost. **Harvey L. Ramsay & Co.**, 636 So. 10th Ave., La Grange, Ill.

AIR-POWER SQUARING SHEARS

An extensive line of Air-Power Squaring Shears is announced by Wysong and Miles Company, as an addition to their line of motorized shears, bending rolls and other metal working machines. The new line includes shears with cutting lengths of 36", 42", 52", 72", 96" and 120". Shears of 72" and less are designed to shear sheets of 16-gauge or less while the 96" and 120" shears have a rated capacity of 18-gauge. Each shear is completely equipped with air valve, cylinder and pilot valve and is ready for operation as soon as connected with the air supply line. Only 75 to 85 lbs. of air pressure is needed for operation. Standard equipment includes front, back and side gauges, positive holddown and a stainless steel scale embedded near each end of the table.



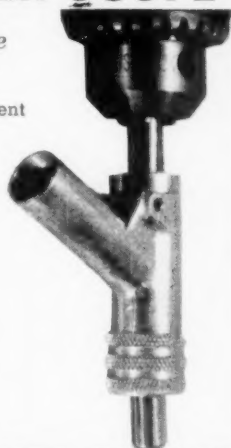
These shears will be especially useful in plants where operations do not justify investment in a motorized shear—in small shops where considerable shearing is done on foot-operated shears, and in large plants where a companion shear will avoid tying up a large motorized shear on relatively light work. They are made by **Wysong and Miles Co.**, 650 Fulton St., Greensboro, N. C.

LOW COST LOCATING BY CENTER SCOPE

*Dependable
Accuracy.*

Ample Adjustment

For Spindle
Run-Out.
For
Drill Presses
Lathes, Mills.



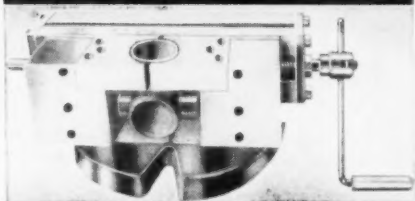
SERIES "M"
\$24.50

CASE EXTRA
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Bulletin M-8

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Over 350 Manufacturers Use
"JOHN'S" DRILL JIGS
Many Plants With 40 To 50
In Constant Use
CAN YOU AFFORD
To Be Without One
?
INVESTIGATE

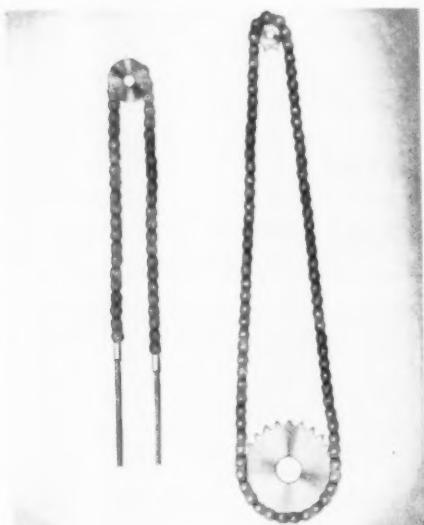


Write To
HEUSER MFG. CO.
1638 N. Paulina St. Chicago 22, Ill.

SMALL STUD AND LOAD CARRYING CHAINS

The miniature Load Carrying Chain and Stud Chain with either non-corrosive or non-corrosive and non-magnetic qualities, are specifically designed for use around very small pulleys and sprockets.

The stainless steel chain is used for most applications. The beryllium copper chain was developed for electronic applications requiring completely non-magnetic materials. The Load Carrying Chain in either material weighs approximately $\frac{3}{4}$ oz. per lineal foot. The Stud Chain in either material weighs approximately $\frac{1}{2}$ oz. per lineal foot.



The Stud Chain has many applications in the fabrication of electronic equipment, cameras, and small, precision instruments. The Load Carrying Chain was developed to operate around pulleys as small as $\frac{3}{16}$ " in diameter and will pass through a 180° turn smoothly, without binding or slipping. This chain is especially adaptable in aircraft cockpit controls and other applications where there is a need for smaller pulleys than those which handle standard control cables. Chain end fittings can be supplied to fit specific requirements.

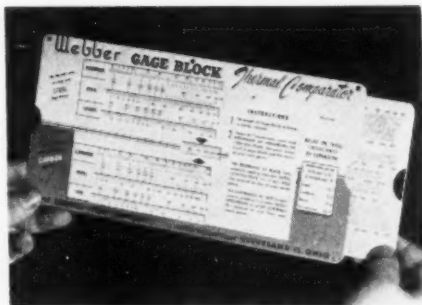
The Load Carrying Chain using stainless steel links with heat treated SAE 4130 pins has a yield strength of 310 lbs. and an ultimate strength of 428 lbs. With beryllium copper links, the chain has a

yield strength of 290 pounds and an ultimate strength of 440 pounds.

The Stud Chain will operate around a 7-tooth sprocket with a minimum diameter of .395". With stainless steel links, it has a yield strength of 100 lbs. and an ultimate strength of 170 lbs. With beryllium copper links, it has a yield strength of 80 pounds and an ultimate strength of 140 pounds. The chains are made by **Sierra Engineering Co.**, 123 E. Montecito Ave., Sierra Madre, Calif.

THERMAL COMPARATOR MEASURES EXPANSION OF DISSIMILAR METALS

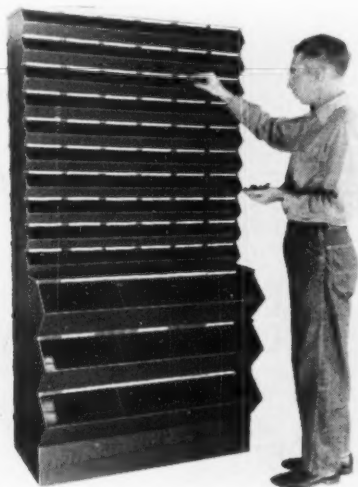
The expansion rates of dissimilar metals have always posed problems to tool and die makers when working with gage blocks at variable temperatures. Roughly, steel grows twice as fast as carbide per degree of temperature. Brass and aluminum, on the other hand, grow approximately twice as fast as steel. This relationship usually calls for time-consuming calculation to determine the exact size to make the part when gage blocks are of one material and work piece is of another. The Webber Gage Company has prepared a slide rule called the Thermal Comparator that gives instant reading of the difference between the blocks and work at various shop temperatures. The user simply sets up the gage block measurement in the small window and obtains a reading that will indicate the difference of expansion or contraction between the gage block and work at 68° F. The part is then made larger or smaller by the amount shown on the scale.



The upper half of the comparator is for use with steel blocks and the lower with carbide. The Thermal Comparator is now included with all Webber Carbide Gage Block Sets and is also available separately. **The Webber Gage Co.**, 12905 Triskett Rd., Cleveland 11, Ohio

SPACE-SAVING STACKBIN SECTIONS

Systematic, space-saving storage of electrical and other small industrial parts and fittings is one of the advantages offered by Stackbin Sections. Interlocking steel units, of two to six bins each, make any required combination of Stackbin Sections possible.

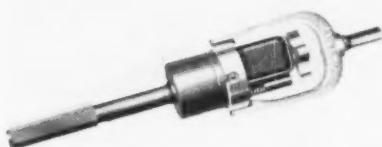


Shown above is one of the many possible combinations of large and small sections which requires only six sq. ft. of floor space. These hopper-front bins make the contents easy to see and reach. They are made of heavy gauge welded sheet steel with folded edges. Five standard sizes are offered, from 4" high, 12" long, and 37" wide to 11" high, 24" long and 37" wide. The manufacturer is Stackbin Corporation, 1085 Main St., Pawtucket, R. I.

NEW PORTABLE HONING HEAD

A new portable honing tool for sizing and finishing holes called the Honall, is used with portable drill, lathe or drill press. It is recommended for generating round, straight holes with accuracy as desired (to one ten-thousandth) and with surface finish as fine as 2 micro-inches r.m.s. in hardened steel. Their range is from 3/16 to 1", in all metals (except lead and babbitt), ceramics, and glass.

The manufacturer points out that the accuracy and portability features of the Honall make it a useful tool for production, tool and die shops, machine and experimental shops, and machine maintenance. The Honall is used for removing distortion after hardening, or after assembly of parts—salvaging parts with defective holes—sizing and finishing dowel pin, header and ejector pin holes, and holes in extrusion dies—making machine repairs without complete disassembly—and for other sizing and finishing applications. It is said to be equally



convenient for removing several thousandths of stock, or only the "last tenth" for an exact fit.

The device is made by Sunnen Products Co., 7910 Manchester Ave., St. Louis 17, Mo.

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Height Gauges
Squares
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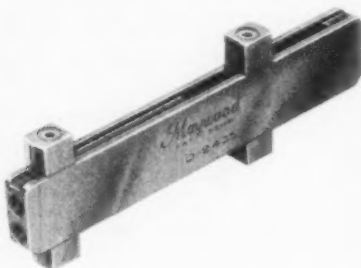
USING STANDARD PARTS — ONE WEEK SERVICE
ONE PURCHASE ORDER COVERS ALL MAKES

DIXON AND RYAN CO.

311 S. TROY EST. 1926 ROYAL OAK, MICHIGAN

COMBINATION FLAT SNAP AND FLAT PLUG GAGE

Maywood Industrial Engineering Co. has introduced a Double Duty Gage consisting of an adjustable Flat Snap Gage and a Flat Plug Gage combined. The adjustable members can be independently set and immovably locked in place for both the Go and No Go sizes. This double



duty unit, when used as a Flat Snap Gauge, can check overall length of pins, inside and outside housing dimensions, shoulders on shafts, etc. When used as a Flat Plug Gage, it can check a wide variety of diameters within its range. The distance between parallel milled surfaces can be gaged simply by reversing the jaws.

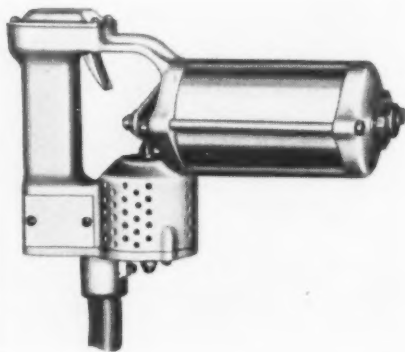
A range of 0" minimum and 8" maximum for the Flat Snap and a range of 1" minimum and 9" maximum for the Flat Plug is covered by a series of five Gages. All parts are made of hardened tool steel RD 62-65, ground parallel and square. The gages have a "Penetrate" blue-black, rust resistant finish. They are made by **Maywood Industrial Engineering Co.**, 36 New Dwight St., Springfield, Mass.

ELECTRIC HAMMER HAS $\frac{5}{8}$ " DRILLING CAPACITY

Syntron Company has recently added its Model No. 10 Electric Hammer, with a $\frac{5}{8}$ " diameter drilling capacity, to its line of Portable "Electromagnetic" Hammers.

The new No. 10 Hammer is self-contained, with the rectifying unit, heretofore housed in a separate container, now incorporated in the handle casting, so that the operator plugs the hammer cord directly to the 110 volt, a.c. power source.

The light weight of the new tool, together with the elimination of the separate rectifier unit, make it a useful tool for sign erectors, painting companies, telephone crews, and others who do much of their work on ladders and scaffolds.



All Syntron Hammer Tools, including the new carbide-tipped tri-point star drills, are available for use with this new hammer, manufactured by **Syntron Co.**, 300 Lexington Ave., Homer City, Pa.

MACHINISTS—TOOL AND DIE MEN—SHEET METAL WORKERS—ETC.

FREE SAMPLE BLUE LAYOUT DOPE

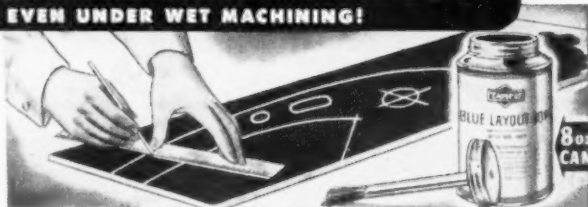
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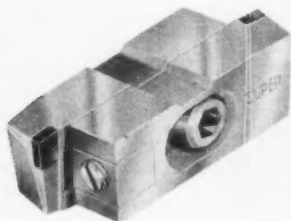
(formerly Tamms Silica Co.)

228 N. LaSalle St., Chicago 1, Ill.

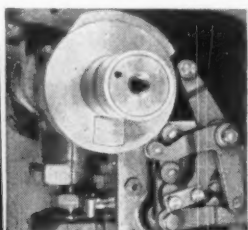


CARBIDE ROUGHING BLADE ANNOUNCED

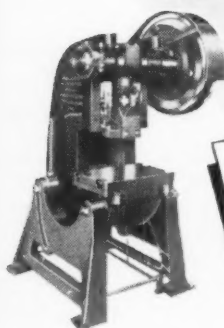
A new carbide tipped expansion type roughing blade for boring bars is announced by Super Tool Company. M. J. Steffes, sales manager of the organization, advises that the new rougher has the same range, up to 4", as the expansion finishing blade recently announced by the company.



The rougher is ruggedly built for heavy cuts with extra support for the carbide tips. It is expanded by loosening the set screw. A lock screw in the slide holds it in fixed position. The roughing finishing blade is made by Super Tool Co., 21650 Hoover Road, Detroit 13, Mich.



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6 MODELS
5 to 30
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EXCLUSIVE—Single stroke non-repeat safety mechanism increases operator efficiency. Allows ample time to check dies and align material resulting in increased output, fewer rejects, and less down time for repair and maintenance.

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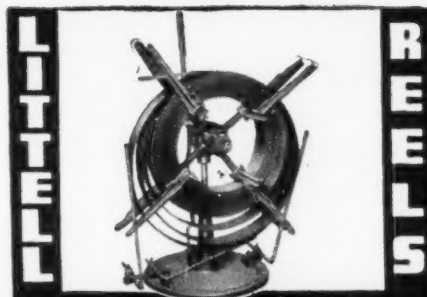
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Write for Bulletin No. P-150B

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Littell Reels are made in 100-lb. to 20,000-lb. capacities. Automatic spindle and cradle types. Plain and motor-driven. Used in thousands of plants for faster production.

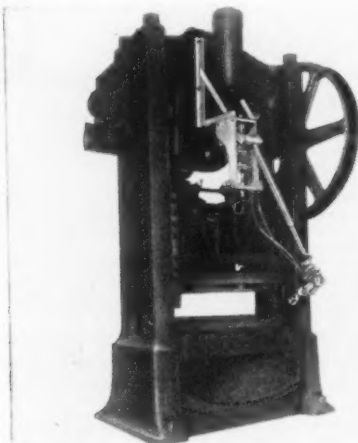
Other Littell products include Roll Feeds, Dial Feeds, Magazine Feeds, Air Valves, Straighteners, Scrap Winders, Pre-Vac Safety Feeders, **REQUEST BULLETINS.**

F. J. LITTELL MACHINE CO.

4153 Ravenswood Ave., Chicago 13, Ill.

SMALL SIZE PRESS UNLOADER

Development of a new junior size Iron Hand, designed to accommodate small and medium sized punch presses is announced by the Sahlin Engineering Company. Used to remove sheet metal stampings from presses automatically, it is recommended for presses with bed widths ranging up to 72" and pressure capacities up to 250 tons.



The unit embodies essentially the same design and operating features of the original and larger size Sahlin Iron Hand (see *Machine and Tool Blue Book*, Jan., 1949, pp. 238-239) but it is more compact and specially suited to the high speed operation of the smaller presses.

The device is valuable as a safety measure since the press operator is required only to place the part in the press, and the often hazardous job of removal is performed automatically by the Iron Hand.

It contributes to higher production; by concentrating on the feeding of the press, operators often step up production since the unloader can be set to catch every stroke. Aside from the lower costs obtainable through fewer accidents and reduced unit stamping costs by higher production, the Iron Hand often frees manpower for other assignments.

The Iron Hand is a self-contained, portable unit which is easily transported from one press to another. It can be used to remove either blanks or formed articles with equal effectiveness. It is adaptable both to open and enclosed type presses. The distances of liftout and swing are adjustable to suit different size stampings.

Synchronized with the stroke of the press by electric control, the Iron Hand works automatically; it can also be locked out of position for die tryout or when the press is idle. The Iron Hand, with its hardened steel jaws, can remove parts weighing 20 pounds or more. It is made by **Sahlin Engineering Co.**, 467 S. Woodward Ave., Birmingham, Mich.

NEW WESTCOTT 3-JAW CHUCK

A versatile new 3-jaw universal chuck combines the speed of a lever-operated chuck with the grip of a pinion-operated chuck. Lathe machinists can lock their work into place as much as 10 times faster with the new chuck than with conventional universal chucks, says the manufacturer. This speed is made possible by inserting the end of a wrench stem into any one of 6 holes in the o.d. of the scroll, then rotating the scroll rapidly by lever action. To secure a final tight grip of the jaws, the machinist slips the end of the wrench stem into any one of six additional holes adjacent to the scroll so that the pinion on the wrench engages with the bevel gear teeth at the back of the scroll. A slight turn

MIGHTY MIDGET
\$29⁰⁰
Less Diamond



RADIUS DRESSER
PUT ONE ON EVERY SURFACE GRINDER

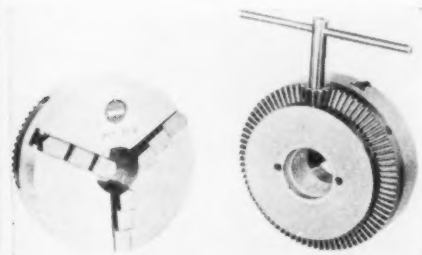
Hardened Shaft. Bearing Adjustable for Wear. Diamond Always Clamped Perfectly In Place. Order Direct on 10 Day Money Back Guarantee.

10" Wheel Size for DoAll or Norton—\$35.00, less Diamond

SPERMAN METAL SPECIALTIES 2199 E. 21st ST., BROOKLYN 29, N. Y.

of the wrench rotates the scroll and results in a powerful jaw grip.

Called Westcott "75", the new chuck has solid reversible jaws—said to be a unique feature in a universal chuck which heretofore has always required two complete sets of jaws—one set for inside and one set for outside chucking.



The need for the usual adapter plate is eliminated because the new chuck is threaded for direct attachment to $1\frac{1}{2}$ "-8 thread lathe spindles. The same chuck can also be used on a milling machine dividing head for which purpose the chuck's 2" body thickness is considered ideal.

The manufacturer is also introducing a new threaded mounting plate to which the chuck can be attached. The mounting plate can then be bolted to the table of a drill press or milling machine, converting the chuck into a sturdy and safe vise or machining fixture. The chuck can also be transformed into a vise for holding cylindrical pieces by simply bolting the mounting plate to a work bench.

The net weight of the new chuck is only $8\frac{1}{2}$ lbs. The 3 reversible jaws are of heat treated steel with precision ground bites and steps. The body is 5" in diameter and is made of semi-steel; the scroll is of durable alloy with rugged spiral thread and teeth designed to with-

stand wear and strain. The chuck's accuracy is guaranteed to center within .003" total indicator reading. The threaded steel mounting plate is available as an accessory. The chuck is made by **Westcott Chuck Company**, Oneida, N. Y.

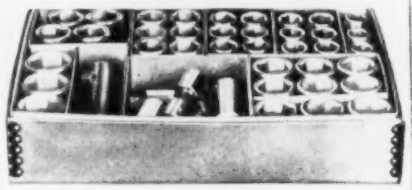
POWER IMPACT SOCKET WRENCH SETS

To help meet the demand for high-strength power impact socket wrenches, three new sets have been added to the Proto line, it is announced by **Plomb Tool Company**.

Set No. 7400C is designed for use with various makes of impact tools and wrenches. It provides six basic $\frac{1}{2}$ " drive socket wrenches with single hexagon openings of $\frac{7}{16}$ ", $\frac{1}{2}$ ", $\frac{9}{16}$ ", $\frac{5}{8}$ ", $1\frac{1}{16}$ " and $\frac{3}{4}$ ".

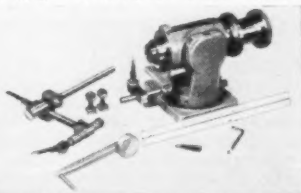
Set No. 7400B also has six $\frac{1}{2}$ " drive socket wrenches, but the openings range from $\frac{9}{16}$ " to $\frac{7}{8}$ " by $\frac{1}{16}$ " steps.

The third Proto set—No. 7400A—includes three to six each of the sockets in the other two sets, along with a



universal joint, adapter, stud puller and four special sockets. It is intended primarily for sellers of power-socket wrenches. However, it is suitable for any industrial plant which repairs its own vehicles and for any large garage or maintenance shop which uses power wrenches extensively. The Proto line is made by **Plomb Tool Company**, Washington St., Los Angeles 54, Calif.

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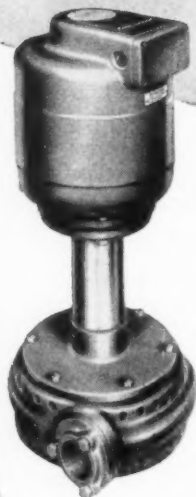
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There is a Ruthman Gusher Coolant Pump to fit your exact needs. A wide variety of types and models are available from 1/30 to 2 HP capacities in immersed types, flange mounted with external or internal discharge, outside pipemounted, tank units and belt driven models. Each and every Ruthman Gusher Coolant Pump is precision built to give you the most efficient service. Banish your coolant worries, specify Gusher Coolant Pumps on your machines.



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other positions in industry.

These are the main conclusions of a comprehensive study recently completed by the Bureau of Labor Statistics of the U. S. Department of Labor.

For purposes of analyzing the long-run outlook for engineers, two assumptions were made; that high levels of general business activity will be maintained; and that the United States will not be engaged in a major war within the next decade.

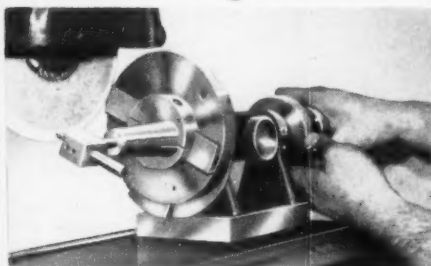
The number of graduates is approaching unprecedented heights owing to the tremendous postwar expansion in engineering enrollments. In the academic year 1947-48, some 32,000 engineering students were graduated—an all time peak. On the basis of enrollments in the fall term of 1948, it may be estimated that about 41,000 students will be graduated in 1949, more than 47,000 in 1950, about 36,000 in 1951.

ENGINEERING OPENINGS TO BE SCARCE

Jobs in engineering, the nation's third largest profession, and one of its fastest-growing occupations, may increase by as many as 100,000 in the next 10 or 12 years to a total of roughly 450,000, the ASME heard at its 70th annual meeting in the Statler Hotel. Engineering school enrollments are now so high, however, that many of the graduates of the next four years may be unable to find engineering jobs, although their training may help them get administrative, sales, or

Among the various branches of the profession, it is likely that the oversupply of new graduates will be largest in electrical engineering. Some mechanical engineering specialties are likely to have an over supply before others. In the civil, mining and metallurgical fields oversupply is expected to occur later and in less degree than in the other branches. The ability of some engineering graduates to obtain employment in an engineering field other than that in which they were trained will, however, reduce the differences in outlook.

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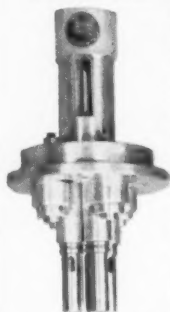
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CLUSTER ADJUSTABLE FULL BALL BEARING DRILL HEAD



This type of adjustable head can drill holes in circular, straight line or staggered formation. The minimum circle obtainable with this No. 1 AC size is 2", maximum circle obtainable 7". When head is furnished with drill chucks, largest size drill, $\frac{3}{8}$ ", when furnished with taper holes in the spindles, largest drill is $\frac{9}{16}$ ".

Heads of this type are made in larger sizes with No. 2 and No. 3 M.T. Holes in the spindles.

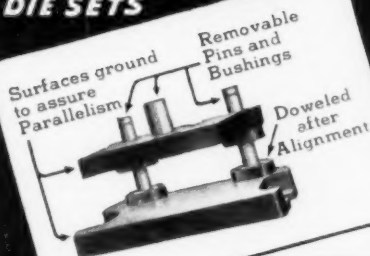
Builders and designers of univ. joint drill hds.

We also design and build special drill heads, and drilling machines to customer's specifications.

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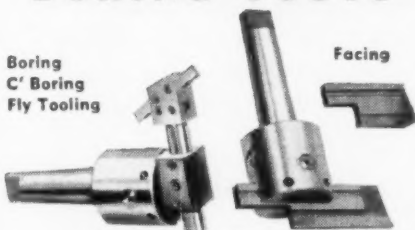
Being originators of Standard Die Sets naturally we are steps ahead in Design—Precision—Dependability and Economy. Baumbach Die Sets can be disassembled. The Leader Pins and Bushings can be used on other size Die Sets—reducing inventorying a lot of Die Sets. Costly machining time is also reduced. Learn all about Baumbach advantages before you buy. Write for circular.

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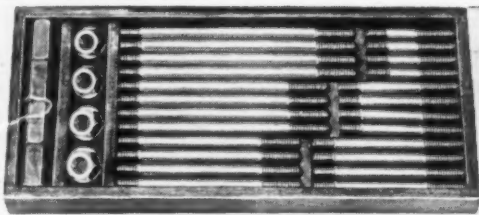
BEHR

Products Company
Warren, Michigan

NEW PUNCH PRESS STUD SET

A new punch press set has recently been put on the market by the Northwestern Tool & Engineering Co. Each set consists of four studs of each length, 3", 4", 5", 6", 7" and 8", as well as four coupling nuts and four flanged nuts. The entire set is packed in a rugged plywood case. The set is furnished with any of the following five sizes of studs: $\frac{1}{2}$ -13, $\frac{5}{8}$ -11, $\frac{3}{4}$ -10, $\frac{7}{8}$ -9 or 1"-8. These precision parts are extremely useful in reducing set-up time on punch presses and similar type machine tools; there is less possibility of hit-or-miss, and consequently inaccurate set-ups.

The manufacturer is also introducing a complete line of hand knobs to be



furnished in either star or hexagonal type; these are sold plain, tapped or reamed, in all sizes from $\frac{1}{4}$ " up to $\frac{3}{4}$ " i.d. Made by Northwestern Tool & Engineering Co., 117 Hollier Ave., Dayton 3, Ohio.

FULLER OFFERS 100% NYLON PAINT BRUSHES

Announcement is made by The Fuller Brush Company of eleven new 100% Nylon paint brushes, to augment the company's present line of 100% pure bristle paint brushes.

It is claimed that the new nylon brushes will last four times as long as bristle brushes on such rough surfaces as concrete, brick, and structural steel. The new nylon filaments are said not to split,

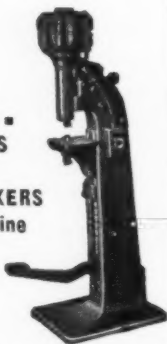
fray or become brittle, to be resistant to most chemicals, and to be unaffected by age or weather, rodents, insects and fungi. They can be used with all types of oil and water paints, synthetics, lacquers, kalsomines and enamels.

One of the original objections to nylon paint brushes—tips too coarse for fine paint—has been overcome in the new Fuller nylon brushes by a special sanding

GRANT

RIVETERS...

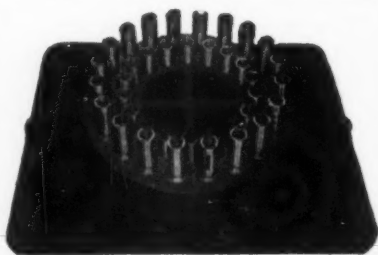
PIONEERS
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—head rivets from smallest to $\frac{3}{4}$ " diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—Sizes to meet all needs—types include Vertical and Horizontal Multiple Spindles.

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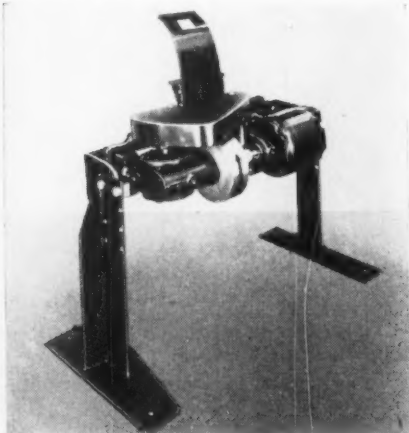
971 E. 8 Mile Road Hazel Park, Mich.

process which softens the tips and improves capillary attraction so that paint is applied smoothly and evenly.

Eight sizes of wall brushes, two stucco brushes and one kalsomine brush are now available. Literature may be obtained upon request to **Industrial Division, The Fuller Brush Co., 3635 Main St., Hartford 2, Conn.**

DURANT HEAVY DUTY SCRAP CHOPPER

The new model No. 400 Automatic Scrap Chopper has recently been introduced by Durant Tool & Supply Co. It is a heavy duty unit, designed to handle scrap material as it comes from a punch press up to 6" wide and .125" in thickness. The new model is an addition to the smaller capacity units, Nos. 100, 200 and 300 (see Machine and Tool Blue Book, May 1949, p. 181).



The manufacturer states that these Automatic Scrap Choppers reduce scrap handling costs, while at the same time increasing the value of cut scrap. Operating costs are negligible, since the choppers are powered by their own electric motor, varying in h.p. according to the capacity of the models.

The scrap chopper needs only to be set up on its legs by means of the two bolts supplied, plug in the cord, and the unit is ready to run. It can be shifted from one power press to another in a matter of minutes. The feed may be on the left or right hand side of the press, or at the front or the back; the unit will perform with equal effectiveness. Complete data will be supplied by the manufacturer, **Durant Tool Supply Co., 155 Orange St., Providence 3, R. I.**

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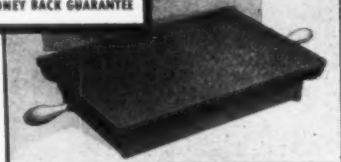
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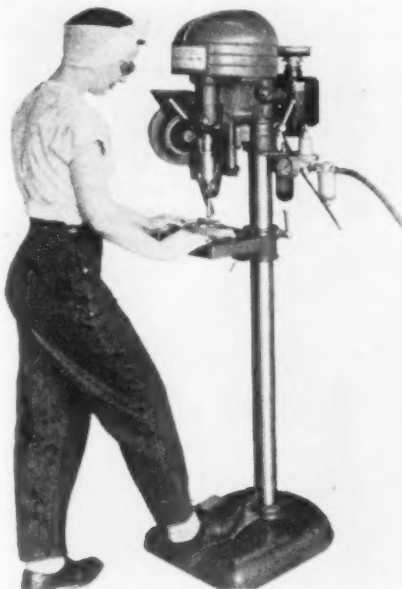
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NEW POWER SCREW DRIVER MINIMIZES OPERATOR FATIGUE

The new Shakeproof Power Screw Driver is specially engineered for high-speed mass production lines; it features hopper feeding, a driving speed of more than one screw a second in the smaller sizes, uniform tightening torque and a minimum of adjustment "down time."



Practically all types and styles of screws in sizes ranging from No. 1 x 1/8" to 1/4" x 3/4", are readily accommodated by the specially designed hopper and driving spindle of the new driver. Installation consists merely of plugging into a 110 volt outlet and connecting to the compressed air supply line.

Operation of the new driver is said to minimize operator fatigue. The operator places screws in the hopper, locates the part to be fastened beneath the driving spindle and lightly presses the air pedal to drive the screw. The hopper feed positions each screw properly for traveling down the track to the bit, where the screw is firmly held in place until one or two threads are engaged. As the desired torque is reached, the clutch disengages automatically. When the operator releases the foot pedal, the spindle returns for another screw.

Breaking or scarring of work is eliminated, since the automatic clutch pre-

vents over-tightening of the screw. A simple mechanism enables the operator to release a jam caused by a wrong sized screw without delay or damage to the machines.

Resetting the unit for a different screw style or size can be effected in twenty minutes, due to the simplified construction of the adjusting mechanism.

Weighing only 240 lbs., the new Shakeproof power screw driver occupies only 21" x 24" of floor space and can be readily adapted to conveyor lines. The unit is made by **Shakeproof Inc., Division of Illinois Tool Works**, 2501 N. Keeler Ave., Chicago 39, Ill.

NEW COMPOUND FOR HARDENING AND ANNEALING STEEL

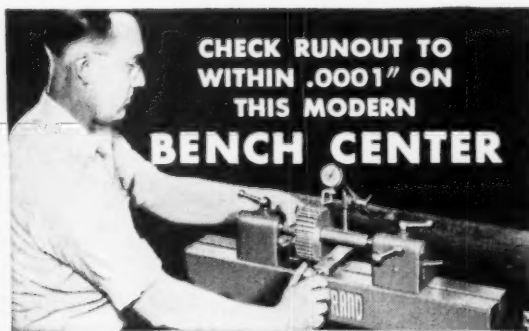
Phoenix Brand Non-Scaling Compound, a product of the Parker Stamp Works, is used in the hardening and annealing of steel, in order to prevent decarburization, scaling, pitting, surface film and excessive discoloring during the heat treating processes. The compound is in powder form (not a salt solution), and is simple to use in any type furnace except the bath type.

This compound, now offered for the first time to industry at large, was developed thirty years ago in an effort

to produce scale free heat treated dies and tools, by a chemist, who is now president and chairman of the board of the Parker organization.



Parker Stamp Works products include steel dies of every size and description, from marking dies the size of a common pin to plastic molds and die casting dies for radios and automotive trim. Complete information on the Phoenix Non-Scaling Compound is available from **Parker Stamp Works, Inc.**, Hartford, Conn.



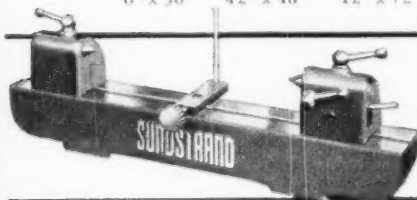
**CHECK RUNOUT TO
WITHIN .0001" ON
THIS MODERN
BENCH CENTER**

COMPLETE RANGE AS FOLLOWS:—

6" x 18"	12" x 36"	12" x 60"
6" x 36"	12" x 48"	12" x 72"

A precision tool for testing and checking parts between centers. Both heads adjustable, locked in place by lever-operated clamps. Work is held between one fixed center while spring loaded retractable center clamps work in position. Dial indicator with adjustable holder available as extra equipment.

FREE ADDITIONAL DATA covering complete specifications and additional features is contained in this bulletin. Write for your copy today. Ask for data sheet No. 492.



**SUNDSTRAND
MACHINE TOOL COMPANY**

2535 Eleventh St. • Rockford, Illinois, U.S.A.

NEW PRODUCTION WORK-HOLDING TOOL

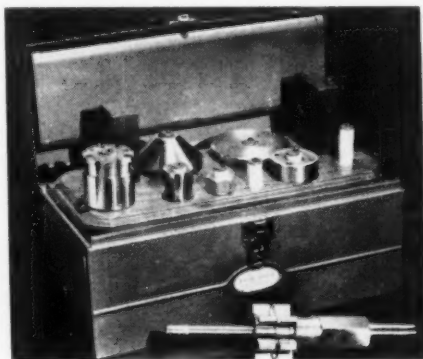
In-R-Tool* is a new work-holding device that can be used in lathes, vises, boring mills, on machine tables and in fixtures, as well as in electric drills and drill presses. It is claimed to save hours of "set-up" and "make-ready" time.

The new inner pressure tool is primarily an expanding arbor. The center member is an arbor within accurate limits. Cores, and pressure members that fit the splines of the cores, are interchangeable. Cores have a range from $1\frac{1}{4}$ " to $2\frac{3}{4}$ " and have n.c. $\frac{3}{4}$ — 10 precision threads. A ratio-limiting collar controls distortion of thin work. This collar regulates expansion of the pressure members, which in turn hold the work firmly in place.

The In-R-Tool* can be used as an expanding arbor when working between lathe centers or when used in chucks or collets. When used in an electric drill or drill press, it is a simple matter to take off a few thousandths of a bushing to get a fit. The new tool can also be used to make thin spacers from plate, and work can be accurately gauged for thickness and diameter.

For jobs on milling machines and other machine tables, the new tool can often be used as a jig, or part of a jig, to save "down time." When used as an anchor, it acts as an inside, self-centering chuck (tolerance: plus or minus

.0015"). On milling machines, the device often eliminates the necessity of tearing down the set-up in order to do other work.



The In-R-Tool* short-work tool (foreground in picture), has a range of from $1\frac{1}{2}$ " to $2\frac{3}{4}$ ". The complete kit, with all accessories, has a range from $1\frac{1}{4}$ " to $2\frac{3}{4}$ ". Other sizes are available on special order. The manufacturer is the **Layne-Held Corp.**, 2005-E South Shelby St., Higginsville, Mo.

* Pats. Pend. & Trademark.

ALLOY USEFUL IN PRECISION CASTING

Cerrocass, a new alloy of reasonable hardness, negligible shrinkage and extensive melting range, has recently been introduced by Cerro de Pasco Copper Corporation. Cerrocass is a non-eutectic alloy of bismuth and tin having the following physical properties:

Melting Range	281°F.—338°F.
Yield Temperature	302°F.
Weight, lb. per cu. in.	.296
Brinnell Hardness	22.
Shrinkage	.0001" per inch

Cerrocass is said to be especially suitable for use in precision casting (Lost Wax Process). Several leading firms in this field have been using this composition for a time sufficient to give it their approval. Because of its long melting range, Cerrocass can be coined readily to reproduce the shape, dimensions and fine surface details of the master pattern accurately. Cerrocass also works in spray guns and for low-temperature soldering of pre-tinned metal parts. Further information is available from **Cerro de Pasco Copper Corp.**, Dept. 12, 40 Wall St., New York 5, N. Y.

NEW HUBLESS WHEEL INTRODUCED

A new, patented metal wheel designed without a hub has been put into the field by Markwardt Manufacturing Co.



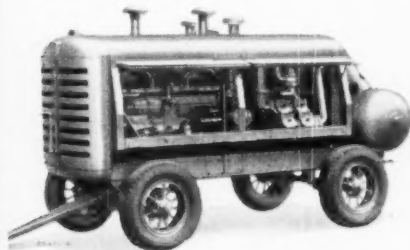
The new wheel, which carries a semi-pneumatic tire, eliminates the protruding axle shaft found on conventional wheels

and thus requires no hub cap. The hub-less feature also becomes a safety feature. The elimination of the protruding axle shaft means that wharf carts equipped with these wheels will no longer rip open cartons and bags.

The manufacturer points out that the tire is easily replaceable because only four screws hold the wheel halves together. The wheel, because of closed surface, is easier to paint and creates rigid, sturdy construction. It is equipped with either self-oiling Chrysler Oilite bearings or ball bearings. Made by Markwardt Manufacturing Co., 3354 N. Buffum St., Milwaukee 12, Wis.

DIESEL-DRIVEN PORTABLE AIR COMPRESSOR

For firms preferring full diesel-engine drive for their portable compressors, a new 50 c.f.m. Mobil-Air unit is announced by Ingersoll-Rand. The engine is the well-known International Harvester heavy-duty UD-24 which starts easily as a low-compression gasoline engine and after a short warmup period is shifted to full diesel operation by means of a single lever.

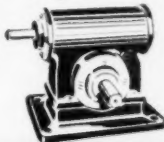


This portable unit, known as the IKA-500, has all the features used on Ingersoll-Rand's KA-Series Mobil-Air compressors in sizes from 105 to 500 c.f.m. The new Floating-Speed Regulator slows down the compressor to the lowest practical working speed that compresses just enough air to hold the pressure. This results in greater fuel savings and higher average air pressures. Full 500 c.f.m. capacity is delivered at rated 100 p.s.i. pressure. Other features include a two-stage air-cooled compressor, hydro-shift flex-disc clutch, channel valves, and sturdy running gear and mountings. In addition, the compressor is said to have a new more efficient air cleaner which is easier to service. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

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Information to fit every condition
of speed reducer installation. Get
the catalog on.....

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SPEED REDUCERS

Shows over 75 types and sizes, worm, spur and combinations. Compact, oil-tight, dust-proof. Save time and money with the data you want right at hand. Wire, phone or write



ABART GEAR & MACHINE CO.

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Chicago 50, Ill.

USE ECONOMY

Headless
Set
Screws



Socket
Set Screws

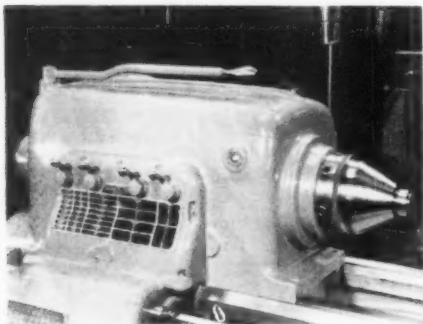
Try Them On Your Next Job!

ECONOMY MACHINE PRODUCTS COMPANY

5212 Lawrence Ave., Chicago 30, Ill.

LEVER-OPERATED COLLET ATTACHMENT FOR MONARCH LATHES

Engineers of The Monarch Machine Tool Company have developed a new lever-operated collet attachment providing up to 1½" round bar stock capacity for application on all Monarch Series 60 engine and toolroom lathes.



Suitable for installation on these machines at the factory only, the attachment has been so designed that it can be used for either draw-in or pusher-type collets. Both types are identical except for the

drawbar, collets and spindle nose adapter, thereby assuring quick conversion by the user from one type collet to the other.

Removal of the drawbar is easily accomplished when this new lever-operated collet attachment is in use, the manufacturer points out. Also, the relation between the attachment and the collet itself can be adjusted readily from the exterior of the machine at the left-hand end of the headstock. The operating lever, extending up over the top of the headstock, is positioned conveniently to the operator standing in his normal operating position. The new lever-operated collet attachment is shown above as arranged for use with the draw-in type collet.

Complete details are available upon request to The Monarch Machine Tool Co., Sidney, Ohio.

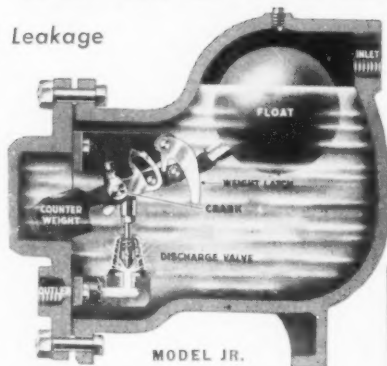
KENNAMETAL PULLEY-GROOVING TOOLS

Kennametal Inc., is now producing tools for machining grooves to the dimensions recently approved by the Multiple "V" Belt Drive & Mechanical Power Transmission Association. These tools are supplied in two types—one having a brazed-on Kennametal blank, the other

Nicholson Air Traps STOP BLOW-THROUGH

Two Features Prevent Leakage

The discharge valve of Nicholson weight-operated air traps is unaffected by dirt and scale because of the large orifice and the nature of the operating mechanism. Thus tight closure and prevention of blow-through is assured. A positive waterseal at valve is another Nicholson leak-proofing feature. Three types, press. to 1500 lbs., for aftercoolers, separators, etc. For details, CATALOG 448.



W. H. NICHOLSON & CO., 117 Oregon St., Wilkes-Barre, Pa.

Steam & Air Traps • Control Valves • Expan. Mandrels • Arbor Presses • Welded Floats

having the Kennametal blank mechanically-held by means of a socket head cap screw (illustrated).

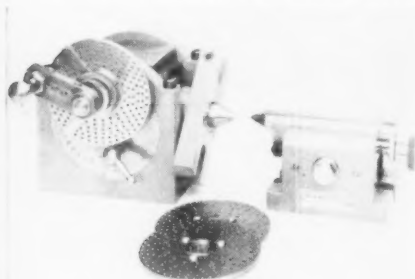


Kennametal pulley-grooving tools are catalogued in styles suitable for cutting grooves for "V" belts A through E. Grade K6 tips are recommended for the usual cast-iron pulleys. Kennametal, Inc., Latrobe, Pa.

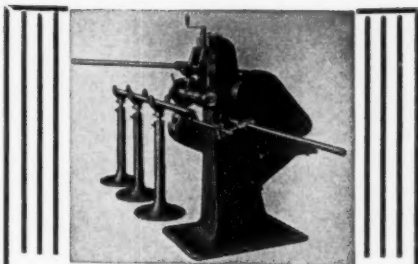
NEW DIVIDING HEAD OFFERS WIDE SELECTIONS

A new dividing head that provides wide latitude in selecting various divisions to meet specific requirements will shortly be marketed. It is said to be useful for dividing operations required in gear cutting, layout, splines, fluting taps or reamers, cams, hex screws and squaring shafts. The unit comes complete with three index plates, each plate having six sets of holes. It will tilt from 5° below horizontal axis to 30° past vertical axis, a total of 125°.

The tail stock is provided with two pins, which align it in a horizontal position with the head stock. It is vertically adjustable for tapered work. The head has a 40:1 ratio. Tail center travel



is one inch. The spindle nose is No. 2 Morse taper socket and 1"-10 threads. A rugged head and tail stock are provided. The head is carried on two heavy trunnions. Marvin Machine Products, Inc., 414 Ford Bldg., Detroit 26, Mich.



Faster TUBE & PIPE CUTTING

Steen High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters $\frac{1}{8}$ " to 3"; $\frac{1}{8}$ " to 6"; 3" to 12".

WRITE FOR CIRCULAR TODAY

Continental Machine Co.

1954 Maud Ave. Chicago 14, Ill.

Micro Supreme
LAY-OUT AND IDENTIFICATION DYE
13 COLORS

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheet, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for trial sample and circular.

MICHIGAN CHROME & CHEMICAL COMPANY

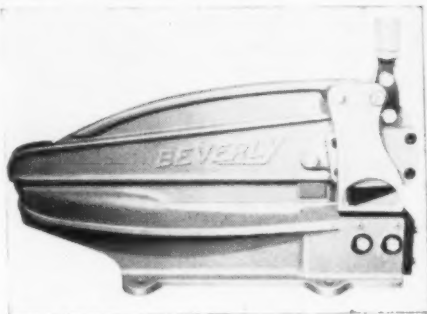
6340 E. Jefferson Ave. • Detroit 7, Mich.

BEVERLY PORTABLE SLOTTER HAS 16-GAGE CAPACITY

A new portable, hand operated deep throat Inside Slotter, designed for fast, accurate inside slotting and punching at any point up to 8" inside, has been introduced by Beverly Shear Manufacturing Co. The shearing capacity is 16 ga. mild steel.

The punch and die arrangement of five high carbon, high chrome cutting blades permit work of punch press accuracy and quality to be done on this small bench slotter. Four lower blades arranged in a rectangular shape to form a die provide support for the shearing action of the upper blade, as it is brought down through the metal and into the cavity formed by the lower blades. All five blades are adjustable to compensate for wear and various thicknesses of metal being cut.

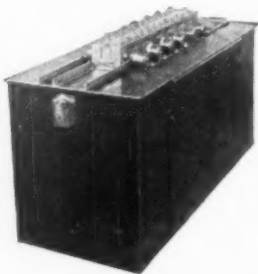
A slot $2\frac{1}{2}$ " long x $\frac{1}{8}$ " wide can be cut at one stroke of the unit. An upper blade for cutting a slot $1/16$ " wide is available on special order. If desired, a continuous cut, during which the work may be pivoted at any point of the stroke can be made on the unit. The point of



the $2\frac{1}{2}$ " long upper blade is 8" from the throat, which enables an inside cut of up to $10\frac{1}{2}$ " long to be made.

The new slotter is made of lightweight, aluminum alloy which assures maximum strength and rigidity. Dimensions: 18" long, $9\frac{1}{4}$ " high (less handle); weight 17 $\frac{1}{2}$ lbs. Made by Beverly Shear Manufacturing Co., 3005 W. 111th St., Chicago 43, Ill.

ROLL FORMING MACHINES AND ROLLER DIES



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery—

Your Inquiries invited.

Maplewood Machinery Co.
2634 Fullerton Ave. Chicago, Illinois

MAXWELL MASTUR Precision Boring Head

MAXIMUM
ACCURACY



MINIMUM
PRICE

These UNCONDITIONALLY GUARANTEED precision boring tools are available in 3 sizes with capacities ranging up to 15" (Maximum bar capacity 1".)

Small, compact, and rigid, MASTUR BORING HEADS provide years of accurate, dependable service. Prices begin at \$44.00 and include shank and bars.

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THE MAXWELL CO.
221 BROADWAY • BEDFORD, OHIO

Immediate Delivery FROM STOCK

GREAVES-SILENT BAKELITE GEARS



No waiting when you order Greaves Silent Bakelite Gears. • We have them in stock NOW! • Your order will go forward immediately. • You'll appreciate the silent operation and added smoothness provided by Greaves Silent Bakelite Gears. • You'll marvel at their great strength to carry big power loads... their remarkable ability to successfully operate completely submerged in water. • You'll welcome their low cost. • No metal reinforcements required. • Save Time... Money... Labor!

We also make silent gears of rawhide and Fabril.

Write for Circular.



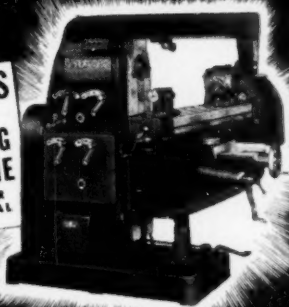
FOR DRIVERS
CUTTING THEIR OWN
GEARS, WE CAN
MAKE IMMEDIATE
DELIVERY ON
BLANKS SAWED TO
SPECIES
DIAMETER AND FACE

Greaves MACHINE TOOL CO.

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Cincinnati, Ohio

BUILT RIGHT! PRICED RIGHT!

GREAVES
No. 2-H
MILLING
MACHINE
PLAIN OR
UNIVERSAL



Simple in design. Easy to operate. Rigid construction including every worthwhile modern feature of milling machine development. With 18 spindle speeds (20 to 1000 R.P.M.) both the universal and plain millers are readily adaptable for heavy duty or light precision production work. Send for bulletin.

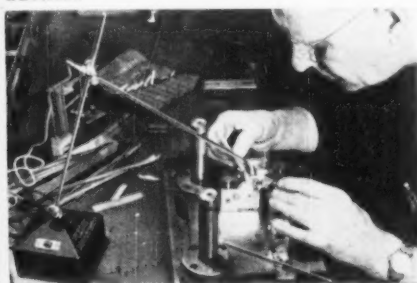
SEND
FOR
BULLETINS
AND
PRICE
LISTS

Greaves MACHINE TOOL CO.

2013 Eastern Ave.
Cincinnati, Ohio

THE UNEEDA LIGHT, A BOON TO INSPECTION DEPARTMENTS

The Uneeda Light is a portable, adjustable lighting unit of interest to all inspectors, tool and die makers, and other industrial workers requiring an intense, white light. The unit was created by a tool and die-maker, who discovered so many practical applications for the light, especially in close precision work, that it has been put into volume production.



The unit is especially useful for light problems requiring close observation. The base is of Bakelite, and all parts are nicked; the connections are all interchangeable; the extension is easily ad-

justable by means of thumb screws to reach locations 24" from the base.

The flexibility of the unit makes it a useful aid to inspectors, since it provides a small, white light which helps to seek out defects, burrs, bubbles, scratches or errors in production work. Its utility to tool and die-makers is also great, because of the light's ability in reaching into niches or crevices which would be hard to reach with ordinary light, for lining up punches in dies, or working with a scribe in close places.

The Uneeda Light is purposely designed to prevent its light from reflecting back into the operator's eyes. It is directional; its flexibility allows a great variety of adjustments, since it can be moved into corners impossible to reach with a conventional shop light. Special reflector caps are designed to throw the light into any desired spot or area, concentrated on the work involved. In certain cases, it is necessary to deflect light over certain phases of work. Small, easily attached mirrors may be adjusted to suit the circumstance or condition. The Uneeda Light is made by **Twentieth Century Manufacturing Co.**, 3716 Montrose Ave., Chicago 18, Ill.

For over 30 years the leader in the field

**OPERATOR
CAN TEND
4 TO 8
MACHINES**

HIGH SPEED SHAVER, equipped with automatic feed hopper, handles most types of headed parts. Greater flexibility, speed, precision for secondary operations. WRITE FOR FULL INFORMATION giving your specifications.

THE H. P. TOWNSEND MFG. CO.

99 BROOK STREET, ELMWOOD, CONN.

Manufacturers of Riveting and Screw Machines



MANUAL TYPE DIAL MICROMETER

The Cady hand model micrometer is designed for easy carrying and convenience for inspecting, checking, and comparing thicknesses in locations throughout the plant, on the production line, or on the road.



The dial is glass covered, 2 $\frac{3}{4}$ " in diameter, graduated in thousandths of an inch. The anvil is 9/16" in diameter and permits calipering of thicknesses up to $\frac{1}{2}$ " on sheet stock or fabricated pieces such as metals, plastics, papers, rubber,

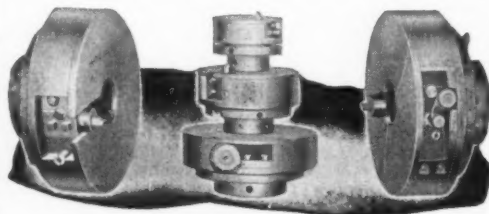
or any other material requiring accurate thickness measure. Anvils can also be supplied with larger or smaller diameters and flat or spherical ends when specified.

This instrument is made to close tolerances for accurate calipering. An external adjustment is incorporated for maintaining the dial indicator at exact zero. The frame is cast aluminum, shaped to fit the hand. The lever is conveniently located for raising the anvil for insertion of material to be measured. The anvil descends with even pressure, approximately 7 to 9 lbs. p.s.i. (TAPPI standard). The new hand model follows the design and mechanical features incorporated in Cady desk and laboratory model micrometers. The manufacturer is E. J. Cady & Co., 134 N. LaSalle St., Chicago 2, Ill.

NEW FOOT VALVES FOR PNEUMATIC CYLINDERS

A new line of foot valves, in $\frac{3}{8}$ " and $\frac{1}{2}$ " sizes, for the control of single and double acting cylinders, is announced by Mechanical Air Controls, Inc.

This "MAC" foot valve line is designed to give the operator the option of using it as either a locking or non-locking type.



MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed — 6, 9 and 12" sizes.

Two-way Tool Feed — 9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes.

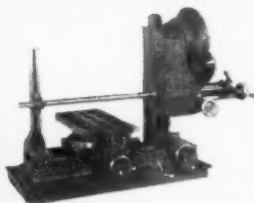
Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

LOW COST BENCH MODEL BORING MILL

For Experimental Dept. Tool Room
Repair Shop & Jobbing Shop



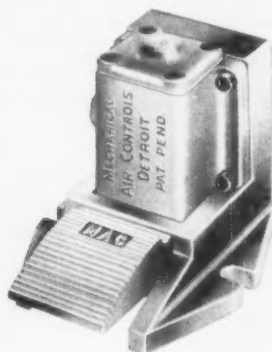
Model M1 Midget Boring Mill

1. Low priced, bench model, precision, horizontal boring mill.
2. 16 speeds from 20-825.
3. Built in universal table graduated in degrees, full 360°.
4. Vertical, cross, and bar movement dials reading in 1/1000".
5. Useful in tool rooms, experimental departments, small shops, repair shops, jobbing shops.
6. Timken bearing spindle, hardened and ground 1 1/4" bar.

Write For Circular M1

Mfd. By **CONRAD MACHINE CO.**
LOMBARD, ILL.

Low treadle design, with shortness and ease of stroke serve to eliminate operating fatigue in the normal non-locking



the locking mechanism and permit the treadle to return to the normal "up" position.

The body design embodies the one moving part—a hard chrome spool on which is mounted "MAC" "C" ring type seals. These seals enter the lapped bores of the body and end caps, to effect instantaneous positive "sealed with air pressure" seal. All tapping ports are on the rear, for greater piping convenience. The straight-through flow of this valve, along with fast positive reversal of the treadle, gives instantaneous operation to the air cylinder. The valve is made by Mechanical Air Controls, Inc., 3049 E. Grand Blvd., Detroit 2, Mich.

Appointment of M. L. Gardner as engineering and service manager of the New England district for the Westinghouse Electric Corporation with headquarters in Boston, Mass., has been announced.

up and down pedal control. The locking application is obtained by a slight forward pressure of the toe when the pedal is in a depressed position. A slight downward pressure of the toe will release

J. K. Gillenwater has been named purchasing agent of Tennessee Eastman Corporation, to fill the vacancy created by the retirement of D. V. Hammock, on November 1.

Plain Type

CLOSED

TRADE



CLOSED

MARK

Offset Type

CONTINUOUS HINGES

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

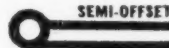
**AUTO MOULDING
& MFG. CO.**

SPECIFICATIONS:
Open Width 1/8" to 6"
Gage Material .040 to .125
Pin Diameter .101 to 3/8"
Lengths to 120"



THREE-FOURTHS OFFSET

**1110 E. 87TH ST.
CHICAGO 19, ILL.**



SEMI-OFFSET



Universal Stock Reel

The Humm Universal Stock Reel is an essential device for the handling and feeding of coil stock to Power Presses.

1. Adjustable Reel to fit various sizes of coil.
 2. Reel is adjustable to suit height of Press.
 3. Reel can be inclined to any position.
- Stock Reel with plain bearing \$55.00
Stock Reel with roller bearing \$65.00

Manufactured By

John Humm Safety Equipment Co.
253 SHEFFIELD AVE., BROOKLYN 7, N. Y.

STERLING DRILL GRINDER



CAPACITY:

$\frac{3}{8}$ " to $2\frac{1}{2}$ " drills.

5" x 9" adjustable table.

MOTOR: $\frac{1}{2}$ hp,
3450 rpm.

NET WT: 250 lbs.

CRATED: 320 lbs.

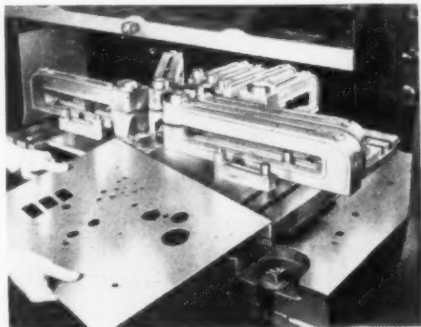
McDONOUGH MANUFACTURING CO.
EAU CLAIRE, WISCONSIN, U. S. A.

WALES PERFORATING AND NOTCHING UNITS

A new system of perforating and notching sheet metal, developed especially for fast, efficient fabrication, is announced by the Wales-Strippit Corporation.

In this new system, Wales self-contained units are used for perforating and notching, which eliminate the need for single purpose dies. A master template, placed on the press bed, is provided with pilot pin holes located over the entire surface area, in the same pattern as the perforations in the finished piece of work. Next, set-up templates, marked with the operation number and punch size, are placed on the top of the master template, in order to identify the pilot pin holes to be used in each operation. The number of operations on each part depends on the quantity, size, and position of perforations. The manufacturer states that Wales Units permit the use and reuse of the same group of units on unlimited set-ups on the master template.

Before this perforating and notching system became available, it was necessary to design and custom build a completely new "fixed" die for each pattern. A group of Wales Units may now be set up in unlimited patterns and put into operation the same day a pattern is released for production. An engineering change requiring a new hole location merely requires drilling a new pilot pin position on the master template.



The above illustration shows a set-up of the series of punching units which perforated the many holes shown in the finished work in the foreground. Note the pick-up pins used to locate the part accurately.

Complete information is available in Bulletin T. **Wales-Strippit Corporation**, 345 Payne Ave., North Tonawanda, N. Y.

ARDCOR ROLL FORMING MACHINE

Roll forming machines which form, curve, emboss and cut in one continuous operation, are built in standard sizes to take material up to 5" wide and 20 ga. thick, by American Roller Die Corp. Larger sizes for material up to 50" wide and $\frac{3}{4}$ " thick, may be supplied. Molding, beading, automotive parts, tubing, and other shapes may be formed on the machine.

The Type H machine, shown above, is an outboard or overhung machine of all steel construction, including base and housings; it may have any number of spindles and handles material of any desired width. The speed in feet per minute varies from 50 to 300.

A time saving feature is the method of adjusting the top spindles. There are two adjusting screws for each top spindle, connected in such a manner that by turning either one of them the top spindle is raised or lowered, maintaining a parallel relationship with the bottom spindle. Springs or secondary adjustments are not necessary; the one screw accomplishes the entire movement.

Precision ball bearings are employed throughout the machine and are provided



with Alemite lubrication fittings. All roll spindles are chrome nickel steel, hardened and ground; all gears are heat treated and are enclosed in the housings.

American Roller Die Corp., 20502 St. Clair Ave., Cleveland 17, Ohio.

NIELSEN Heavy Duty

*Live
Centers*

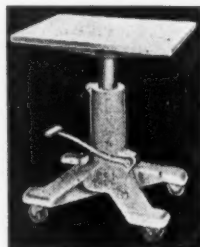
Write for
catalog on
live centers

Adapted
for heavy
duty work.
Precision type
ball and roller
bearings assure
maximum capac-
ity for high speed
production and long
service.



NIELSEN, INC. LAWTON, MICH.

• PORTABLE • ELEVATING TABLE



**Saves
TIME
and
LABOR**

Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height up to 15½", leaving operator's hands free. Table swivels and locks in any position.

SEND TODAY FOR ILLUSTRATED
CATALOG NO. 2

MIDWEST TOOL & ENG. CO.
112 WEBSTER ST., DAYTON, OHIO



Produce your small
precision parts with
well-known "DERBYSHIRE" accuracy

Illustrated:

The DERBYSHIRE ELECT lathe with 18" bed; ball-bearing headstock with collet closer attachment; double compound rack-and-pinion slide rest with front tool post slide graduated to swivel 360°; six-position turret to take standard tools.

Write for Catalog

F. W. DERBYSHIRE, INC.
WALTHAM 54, MASS. 157 HIGH ST.

Over 40
FORD CARBIDE CUTTER SHAPES

FORD
CARBIDE ROTARY CUTTERS —
MACHINE GROUND

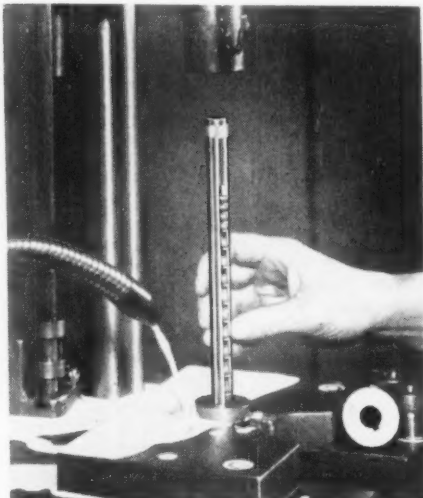
For filing, grinding and finishing, burring, counter-sinking and chamfering, light milling, profiling, tool, die and mold machining, Ford carbide cutters will do a better job in less time at a lower cost—and without a major capital investment.

Send for Bulletin C-549 - Sizes and Specifications

M. A. FORD **MFG. CO., INC.**
Davenport 6, Iowa

NEW PRODUCTION-TYPE BROACHES

Kase Machine Company has announced a new type "LK" Glenny push broach, designed especially for production operations. The new broach incorporates a special tooth design which facilitates single-pass broaching in a variety of materials.



The illustration shows a new "LK" Glenny broach cutting a 3/16" wide x 3/32" deep keyway in a cold-rolled steel workpiece. Production on this job is approximately 250 pieces per hour. A single pass of the broach through the workpiece cuts the keyway, and secondary operations are eliminated. Only a 2-ton pressure is required of the Zagar hydraulic press shown to push the broach through the steel workpiece. Because of this low pressure requirement, "LK" broaches can be used in hand-operated presses or air-powered units.

The new "LK" Glenny broaches are similar in appearance to the standard broaches in the line, except that they have a longer cutting blade and a special tooth design to facilitate single-pass cutting. They also feature infinitely variable adjustment for depth of cut and interchangeable blades. Type "LK" broaches can be furnished in a complete size range. They can be equipped with bushing-type adapters to permit keyway cutting in bores larger than broach diameter. Kase Machine Co., 18428 Buffalo Ave., Cleveland 19, Ohio.

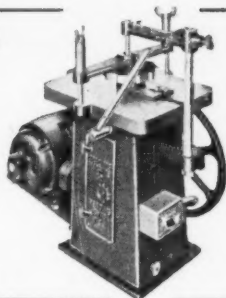
NO BUSHINGS, GUIDES or PILOTS NEEDED!

THE READING BROACH KEYSEATER

The Reading Bench Machine requires no bushings, guides or pilots. No other machine like it. Very fast—capacity from $\frac{1}{8}$ to $\frac{3}{4}$ cutter.

Low first cost—prompt delivery.

READING MACHINE COMPANY, Reading (Cincinnati), Ohio



FLAME FAILURE SAFEGUARDS FOR GAS-OIL BURNERS

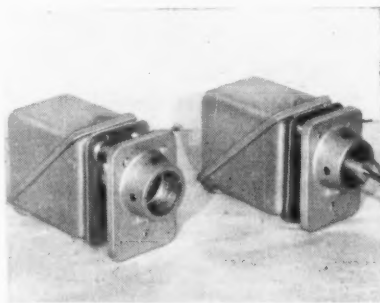
Most industrial installations of gas-oil burners use heavy grades of oil as the principal fuel, and gas as the stand-by fuel, or burn gas as the principal fuel and lighter grades of oil as the stand-by fuel.

Fireye (Combustion Control Corp.) announces the availability of Flame Failure Safeguards and Programming Systems to take care of either combination with safety and with a minimum of electrical and mechanical adjustment when changing from the principal fuel to the stand-by fuel.

With heavy oil as the main fuel and gas as a stand-by fuel, Fireye System FF-2 is used. This consists of a photo-electric scanner, a flame rod, and the programming control. When the system is used on a heavy oil, the electronic rod monitors the gas pilot flame, preventing the main fuel valve from opening until the flame is established. The photo-electric scanner monitors the main oil flame, turning off the entire system in case of flame failure.

With gas as the main fuel and light oil as the stand-by fuel, Fireye System

FF-6 is used. This system includes an electronic rod and control. With either gas or oil as a fuel, the electronic rod monitors the continuous gas pilot, providing through the control instantaneous



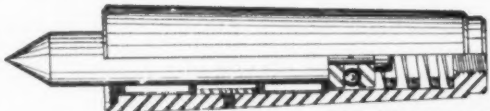
safety shutdown of the main flame on pilot flame failure. Monitoring operations on gas and light oil are identical, and no wiring changes are required on the changeover. The Fireye Systems are made by Combustion Control Corporation, 77 Broadway, Cambridge 42, Mass.

"NIROL" NEEDLE BEARING LIVE CENTER

Designed for heavy loads and precision work. Minimum overhang of center avoids vibration and chatter. Heavy, powerful spring compensates for any expansion of work due to heating during machining. Compact, neat, and rugged. Used for high speeds or heavy roughing cuts.

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- No. 2 M.T.— 21.75
- No. 3 M.T.— 26.75
- No. 4 M.T.— 32.50
- No. 5 M.T.— 49.75



PAT. APPLIED FOR

- No. 6 M.T.—\$ 87.50
 - No. 7 M.T.—110.00
- Bullnose and female center inserts available in sizes listed.

L. F. TREICHLER—PRECISION GRINDING

900 Route 29, North Plainfield, N. J.

PUNCHES and DIES



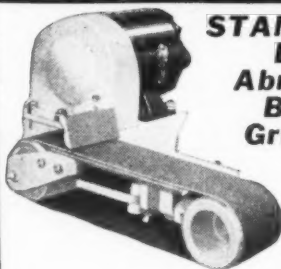
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STANDARD D-4 Abrasive Band Grinder

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This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre... at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood 4x36 1/4" band. The ideal portable unit.

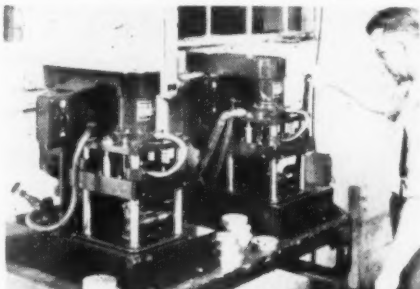
OTHER STYLES AND SIZES IN NEW
MANUAL ON FINISHING—WRITE TODAY

WALLS SALES CORP.

306 E. 38th St., New York 16, N. Y.

THE ZAGAR JIG DRILLER

The "Jig Driller" is a drill jig converted into a drilling machine. The unit satisfies the need between standard single spindle drilling machines and special purpose drilling machinery. It consists of a four-post pump type drill jig on which is mounted a standard Zagar gear-



less drill head with a hole pattern to suit the part being drilled. In the middle of the jig is a bushing plate which holds the various drill bushings and the locators for the parts being drilled.

The feeding is accomplished by the operating handle which feeds the parts into the drills through the standard rack and pinion mechanism as provided in the drill jig. For some jobs, this feeding mechanism can be supplanted by an air or hydraulic cylinder.

The four-post construction of the drill jig is extremely rigid. There is not the usual C-clamp expansion which is common to all single spindle drill presses. The leverage or feed capacity is limitless, depending upon the length of the handle.

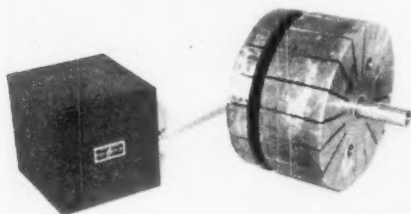
The drill head is driven through V-belts. Correct drill speeds are obtainable by the proper pulley ratios. Power is supplied by an electric motor of suitable capacity. The "Jig Driller" is set into a coolant tank; the coolant pump is driven from the reverse side of the electric motor shaft.

The above picture shows two "Jig Drillers" being used on a bench. They drill fifteen holes each, to complete thirty holes in circular drill stands, a typical example of the wide use to which the unit may be put. The "Jig Driller" is made by **Zagar Tool Inc.**, 23880 Lakeland Blvd., Cleveland 23, Ohio.

Appointment of **Walter W. Kempfert** as vice president in charge of sales is announced by **Maurey Manufacturing Corporation**, Chicago.

ALL-ELECTRIC POWER UNITS OFFER WIDE STROKE RANGE

Black & Webster, Inc., offer their new all-electric power units, designated as the "Electrothrust." These devices are capable of applying pressures up to several tons for operations requiring pressure, impact, or impact followed by pressure.



The "Electrothrust" models offer strokes of from a fraction of an inch to several inches in length. According to their makers, the efficiency and performance of these units is achieved through their unique construction and the use of a special control circuit. The "Electrothrust" units are of cylindrical cast electrical steel construction; they are easily mounted, and operate from any a.c. lighting circuit. The model illustrated is 9" in diameter and develops a maximum pressure of 6000 lbs.

The units fall into two general classes of design, determined by the work to be done: work requiring an increasing pressure, ranging up to several tons operating through a stroke of a fraction of an inch. The maximum thrust is applied at the end of the stroke, and may be used for intermittent or continuous duty. The other type is work requiring thrust in the order of 100 lbs. or less, exerted uniformly over the strokes, up to approximately 8". This class of unit may also be constructed to deliver an increasing thrust at the end of the stroke. Both these classes utilize rectified current from a.c. lighting circuits.

The "Electrothrust" power units are made by **Black & Webster, Inc.**, 30 Pleasant St., Needham 92, Mass.

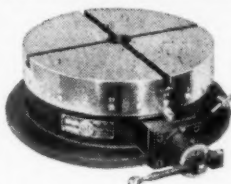
The appointment of **F. P. Taugher** as manager of engineering for the Westinghouse Electric Corporation's Industrial Control Division, Buffalo, N. Y., was recently announced by G. H. Welch, manager of the Division.

TROYKE ROTARY TABLES WORM WHEEL OPERATED ROTARY TABLES . . .



9" - 12" - 15" -
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BALL BEARING STATION INDEXING TABLES . . .



12" - 15" - 18"

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Fit Any Press*



Made in 4 models for handling scrap as it comes from a power press, up to 6" wide and up to .125" in thickness. Requires no expensive connections, and can be installed for any press (either side or front or back) in a few minutes. Can be quickly shifted from one press to another. Assure simpler scrap handling and increase scrap salvage value. Write for illustrated literature giving detailed information.

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155 ORANGE ST., PROVIDENCE 3, R.I.

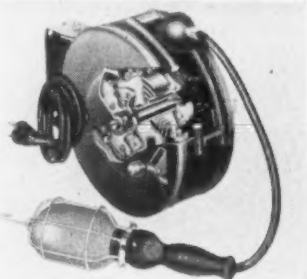
HEAVY DUTY ELECTRIC CORD REEL

Aero-Motive Manufacturing Company announces its new Model SW-25 Electric Cord Reel. The unit is of heavy duty construction with oversize bearings and shaft.

The features of this reel include an external trigger lock and the design used in getting the cable out of the reel. The cable outlet has a long opening which is equipped with a roller at each end, and a heavy side beading which is said to promote greatly increased cable life.

The new reel is also equipped with a swivel mounting, which further reduces

cable wear, as the unit will swing when the cable is pulled sideways. A 30" plug-



in lead is furnished.

The reel is made by Aero-Motive Manufacturing Co., 1803 Alcott St., Kalamazoo 24, Mich.

NEW MOLD STEEL OFFERS GOOD HOBGING QUALITIES

The Carpenter Steel Company announces a new steel for plastic mold cavities and force plugs which is known as Samson Extra. It is an alloy steel which is said to provide excellent hobbing qualities plus good machinability, with high core strength.

It is claimed that with the new steel many intricate mold shapes can be hobbled in one operation, deeper impressions can be pushed with present equipment, and more accurate reproduction of hob design is possible. Samson Extra has a Brinell hardness of about 105. In a test to determine hobbing qualities, a mold blank 1.75" in dia. by 2.25" long was used. A hob measuring .910" in dia. tapered .045" per in. was sunk into the mold blank using a load of 110 tons with one push. A depth of cavity measuring .71" was obtained. Assurance of a clean



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Measure: "O" Ring Grooves
Snap Ring Grooves
From 1/2" to 12"

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RIMAT MACHINE TOOL COMPANY
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sound mold cavity is guaranteed by 100% acid disc inspection of the steel.

Tests show that mold cavities made from the new steel have high strength and resistance to sinking, because the yield strength of the steel when oil quenched is double the 38,000 p.s.i. of a good grade of hobbing iron. Average properties of the steel after case hardening are:

	Oil Quench	Water Quench
Case Hardness —		
Rockwell:	C-64	C-65
Core Hardness —		
Rockwell:	C-20	C-25
Physical Properties Core —		
Tensile:	108,000	120,000
Yield:	69,000	91,000

Although the new steel is annealed for easy hobbing, and is therefore soft, it is said to machine satisfactorily because of its unique analysis and control in manufacture. The Carpenter Steel Co., Reading, Pa.

NEW LO-HEAD CRANE BLOCK

A new American Lo-Head crane block, in capacities from 10 to 50 tons, is now available for all types of hook work. The new block, with its shorter overall length, permits 1½ to 2 foot higher lifts without lengthening the boom. The forged hook operates on Timken tapered roller bearings and the cast steel sheaves



are equipped with Hyatt Hi-Load bearings. Lubrication is necessary only once each 2,000 hours. Alemite fittings are provided for standard grease gun use. The crane block is made by American Hoist & Derrick Co., St. Paul 1, Minn.

HIGH SPEED AUTOMATIC STAKING MACHINES



Cut your assembly costs with **HIGHSPEED** ... for staking or riveting fixed or movable joints at a rate of more than 1000 pieces per hour! Foot treadle ... safe ... uniform adjustable hammer blow.

COLD RIVETERS

Let us send you a free survey of your riveting problems. Send samples of your work completed to the riveting stage. We'll return them along with guaranteed production data. No obligation ... write today.

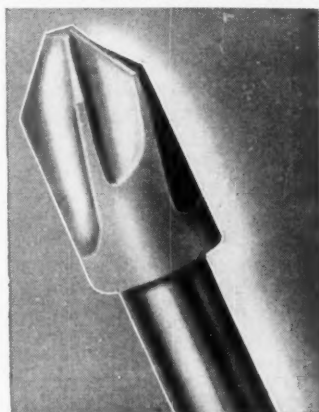
**HIGH SPEED
HAMMER CO., INC.**



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SOLD THRU LEADING SUPPLY HOUSES



GROBET CHATTERLESS COUNTERSINKS

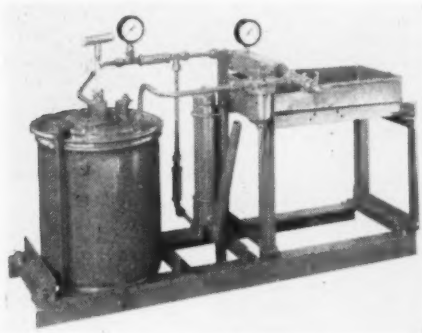
Six staggered cutting edges give shearing cut that eliminates all chatter.

SEND FOR CATALOG C-CI.

GROBET FILE CO. of AMERICA, INC.
421 Canal Street N. Y. 13, N. Y.

FAUVER HYDRAULIC TEST EQUIPMENT

A bench-mounted Hydraulic Test Fixture for checking hose assemblies, piping, tubing, gauges, valves, cylinders, etc., has been designed and built by J. N. Fauver Company, Inc.



The equipment consists of a low pressure pump for the quick filling of equipment being tested from a reservoir that holds approximately 3 gallons. When the low pressure gauge shows 100 p.s.i., the high pressure pump is actuated up to 5000 p.s.i. Higher pressure units are also available if required. When the test is completed, the high pressure valve on the manifold is opened, and the oil drains through the Cuno filter to reservoir. **J. N. Fauver Co., Inc.** 49 West Hancock St., Detroit, Mich.

AIRCO MONOGRAPH SHAPE-CUTTING MACHINE

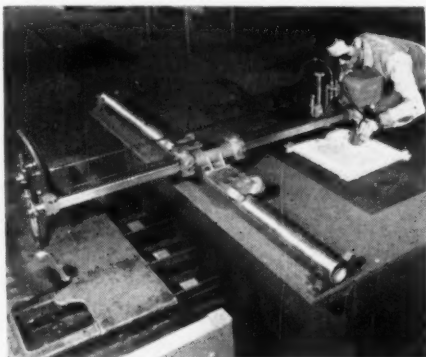
Air Reduction has announced a new portable, oxyacetylene, shape-cutting machine, the Airco No. 3 Monograph. According to Airco, the new unit brings machine gas cutting within the economic reach of thousands of shops which, up until now, have been unable to handle their own shape-cutting.

The Monograph will cut steel up to eight inches in thickness, in any shape within a 56" by 32" area, at speeds ranging from 3 to 30 inches per minute. The length of the cutting area can be extended by adding tubular rail extensions. The machine will also handle straight-line, circle and bevel cutting jobs with high accuracy.

The Monograph weighs only 110 lbs., the tubular rail an additional 35 pounds, constituting a portable machine that can easily be transported from shop to shop or to the work. The entire unit is packed in a carrying case that can be conven-

iently handled by two men and stored in a 7' by 1½' space.

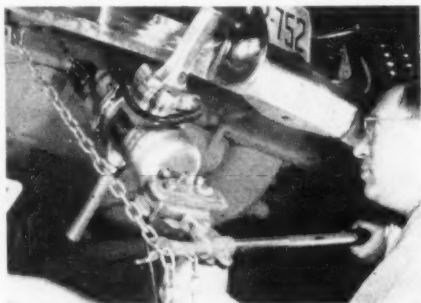
Included in the standard kit are a manual tracing device, torch, tip, tubular rail, hose, straight edge, radius rod and carrying case. The manufacturer is offering prospective customers the oppor-



tunity of trying out the Monograph in their own shop, on their own work. Details may be obtained from **Air Reduction Sales Co.**, 60 East 42nd St., New York 17, N. Y.

PORTABLE DRILL PRESS

Sudenga Iron Works has developed a portable drill press called the "Port-A-Drill," designed for use with any ¾" to ½" electric drill. Weighing 26 lbs., this drill press may be used as a shop tool, on the workbench, or may be dismantled as shown in the illustration, to secure drill press action in hard-to-reach spots.



The electric drill is held in place by a patented clamp. Leverage is provided by anchoring the sturdy steel chain and applying pressure on the lever arm. The "Port-A-Drill" is made by **Sudenga Iron Works**, George, Iowa.

GAS-FIRED FORGE FURNACES

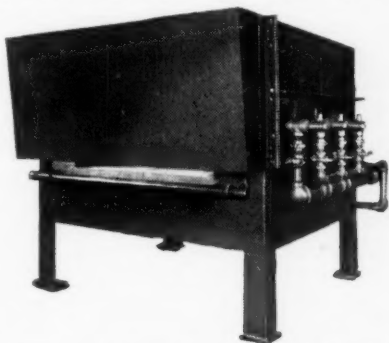
The improved line of Eclipse Gas-Fired Forge Furnaces has been engineered for heavy duty and continuous operation, at the usual forging temperatures of 2200° F. The furnace shell is constructed of heavy angle framework, with the sides and back of steel plate, electrically welded to sturdy structural steel legs—a construction designed to withstand the heavy pounding to which forge furnaces are subjected.

Heat loss through the walls is reduced to a minimum by the use of first quality insulating firebrick. This type of wall construction cuts down fuel consumption, another desirable operating economy.

The burners used are of the semi-nozzle mixing McKee Entrainment type, and are located so as to prevent flame impingement on the pieces being heated, and to give uniform heat distribution. A McKee Zero Governor gives automatic control of the air-gas ratio throughout the entire range of the burner. Sillimanite tuyere burners are used to insure long block life and a minimum of slag.

Fuel burners are designed to use low pressure gas, 3 to 10 w.c. and 16 oz. air,

but high pressure burners are also available. To increase the safety factor, the operator is protected by a curtain of air which carries the heat away from the operator and behind the specially de-



signed, refractory-lined heat shield which is adjustable to cover the section of the slot not being used. Full specifications are contained in Bulletin E-3. Eclipse Fuel Engineering Co., Rockford, Ill.

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FLEXIBLE SHAFT

Containing new and useful information on WYCO flexible shafts and grinders. Many new models, single and multiple speeds.

Clear concise illustrations showing parts and accessories, with explanatory details on grinding, sanding, wire brushing, polishing, de-burring and many other operations. You can't afford to be without this up-to-the-minute reference.



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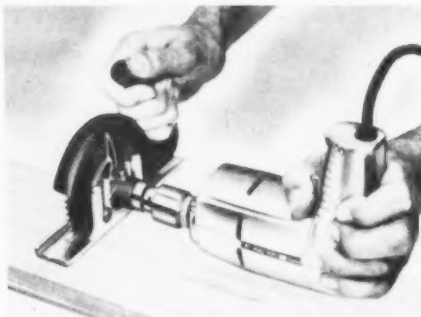
THEY HAD TO BE GOOD
TO BE SO FAVORABLY
KNOWN FOR SO LONG

Established 50 Years

REID BROTHERS CO., Inc.
BEVERLY, MASS.

NEW PORTABLE POWER SAW

A new portable power saw that uses any 1/4-inch electric drill for power has been introduced. One end of the saw arbor has a 1/4-inch shank that fits into the drill chuck. The light weight and the small size make it easy and safe for any trimming, rip and cross-cut sawing, and dado cutting up to its rated capacity.



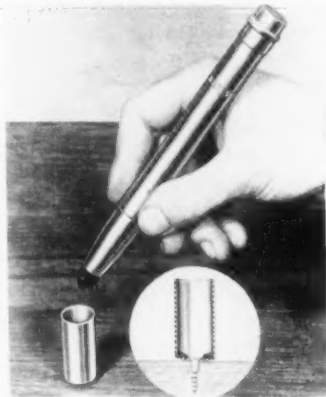
Called the Zip Sawyer Jr., this portable power saw is of simple and rugged construction. Since it is driven direct from the electric drill, there are no gears or

other connecting mechanism. A one-piece, cast aluminum-alloy frame contains the saw blade guard, bearing for saw arbor, and comfortable handle. An aluminum, adjustable plate shoe fastens to the side of the frame. Besides being indexed for straight-line cutting, both sides of the plate are machined and can be used against a guide for long rip or dado cutting.

The saw is furnished with a combination rip and cross-cut blade, 4" in diameter, giving a maximum depth of cut of one inch. Other blades can be substituted for other cutting. The weight of the unit is only 1 1/2 pounds. It is made by **Portable Electric Tools, Inc.**, 320 W. 83rd St., Chicago 20, Ill.

FOUNTNBRUSH MARKS VARIETY OF SURFACES

To meet the demand for heavy duty marking in industry, Cushman and Denison have added a "King Size" to supplement their pocket size Flo-master Fountnbrush. The new marker, made of light-weight, sturdy aluminum, has a large ink capacity. The "King Size," with interchangeable felt nibs, makes lines varying from 1/8 to 1" in width.

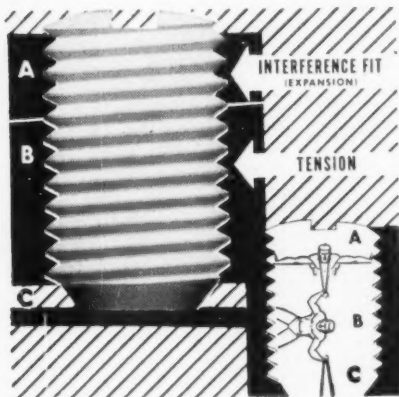


As well as corrugated cartons and wood crates, it will mark on metal, glass, cellophane, plastics, fabrics and other hard-to-mark surfaces. It is equipped with a leakproof, automatic spring valve. A special cap design permits a dual use as a stand or cap. The stand keeps dirt away from the nib, and avoids loss of the Fountnbrush under wrapping materials. For best results, instant-drying, waterproof Flo-master inks are recommended. The Fountnbrush is made by **Cushman and Denison Manufacturing Co.**, 133 W. 23rd St., New York 11, N. Y.

NEW SELF-LOCKING SET SCREW

A new Self-Locking Set Screw and Adjusting Screw called Zip-Grip does not require any lock nuts, wires, impinging locking screws, deformed or riveted threads. The new Self-Locking Screw is specifically designed for set screw applications in which excessive vibration is a factor, and for regulating and adjustment applications, in which instantaneous locking at a precise point is desired. Patent has been applied for.

The Zip-Grip is described as being the first set screw to have triple-locking action by a combination of Interference Fit, Tension and the Locking of the set screw against the shaft or other part. As the cutaway illustration below shows, the lower part of the screw, (B) which enters the hole first, has a standard thread. The upper section of the screw, (A) designated as the "activating area" has a higher pitch diameter of the thread section which creates an interference fit or expansion effect against the thread flanks. This results in a tension or opposed-force action, causing the



thread section of the upper part to be drawn downward and that of the lower part to be drawn upward, in the direction of the screw's locking action against the shaft.

The new device is claimed to reduce production costs on tapping operations, as no closer fit than Class Two is required and the extra tapping for counterlocking and extra set screws is eliminated; it increases assembly speed, because the screws are quickly inserted and tightened, with no time taken up by adjusting outside locking devices.

The new Zip-Grip Screws are available

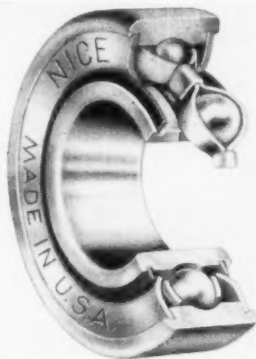
in all metals, including soft or hard steel, case hardened or heat-treated stainless steel, brass, bronze or aluminum. They may be had with any type head. A Data Bulletin is available upon request to the makers, **Set Screw & Manufacturing Co.**, 36 Main St., Bartlett, Ill.

COMPOSITION-SEALED BEARING DESIGN

The Nice Ball Bearing Company has announced the manufacture of sealed bearings of a new simplified design. Referred to as "composition sealed", the new design involves the use of an oil resistant rubber coated fabric in contact with a specially formed metal shield.

Said to have been exhaustively field tested at great success, the new design is claimed to retain lubricant and exclude foreign material effectively, performance advantages that are necessary requirements for many bearing applications.

Heretofore available metal shielded only, the new composition seal has been applied to Nice 1600 and 3000 series bearings. Series 1600 are "ground all over"



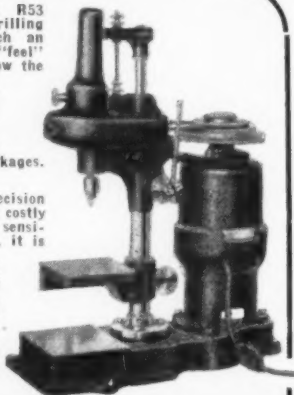
precision annular bearings while Series 3000 (illustrated) are unground radials of the same "precision type". Made by **The Nice Ball Bearing Co.**, 30th St., and Hunting Park Ave., Philadelphia, Pa.

According to an announcement by J. Carl Bode, president, **Robert A. Speck** and **George R. Milne** have been appointed vice presidents of National Carbide Corporation; Mr. Speck in charge of sales and distribution, Mr. Milne in charge of operations. Mr. Milne will continue to have his headquarters in Louisville, Ky., in order to remain close to the company's manufacturing operations.

YOU CAN ACTUALLY FEEL THE PRECISION OPERATION

Yes, the Model R53 HIGH SPEED Drilling Machine has such an extremely fine "feel" that operators know the progress of the drill particularly at the point of "break-through" . . . thus eliminating many small drill breakages.

The R53 does precision work . . . prevents costly rejects. Although sensitive and accurate, it is rigidly built. Spindle speeds 750, 1500, 3000 and 6000 RPM, capacity No. 80 to 1/4" dia. drills. Write today for full data and literature.



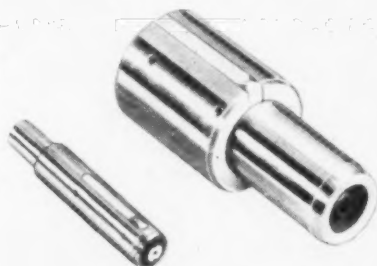
High Speed Hammer Company, Inc.
311 NORTON ST.
ROCHESTER 5, NEW YORK

BLADE CONTACT AIR SPINDLES FOR SHEFFIELD PRECISIONAIRES

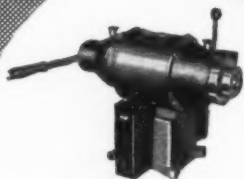
Announcement of blade contact type air spindles for column and dial type Precisionaires is made by the Sheffield Corporation. They enable an instrument type check to be made of practically any hole regardless of finish, interruptions or size.

The spindles consist essentially of a hardened steel body, slightly smaller than minimum hole size, with a hardened steel contact blade either pivoted or floating, the action of which controls the flow of air through the jets.

Such spindles can be made with one or more blades and with different arrangements of jets and spring-loading of the blades, as required for true or average diameter by the particular application. The minimum size of single blade spindles starts at approximately 3/8" in diameter, depending upon the application.



Holes having a surface finish rougher than 75 to 100 micro-inches can be measured accurately for out-of-round and taper as well as for diameter. Readings for these three conditions and dimensions are unaffected by even the coarsest surface finish. Such interruptions as oil holes of grooves, keyway slots, ports, etc., do not affect the accurate readings made with this type of spindle. Precise measurement of out-of-round, taper and diameter of holes in parts made of powdered metals and other porous materials is now possible. Certain models are designed to permit practically 100% exploration of the hole all the way to the bottom. Made by The Sheffield Corp., Dayton 1, Ohio.



SCHAUER SPEED LATHES

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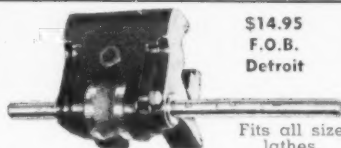
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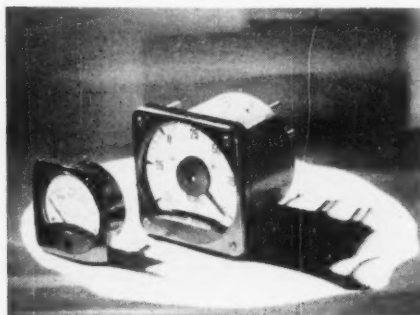
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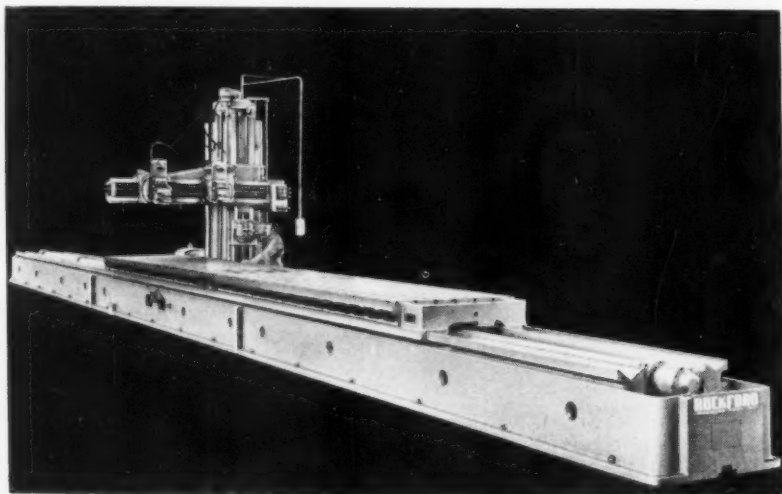
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ROCKFORD HYDRAULIC OPENSIDE PLANER

The new Rockford Hy-Draulic Openside Planer has a 33-foot cutting stroke, the first Rockford Planer to be built with this length of cutting stroke. The planer is 73 feet long overall, and about 14 feet high. The maximum cutting stroke of 33 feet has speeds that are infinitely adjustable up to a maximum suitable for carbide cutting tools.

may be set independent of the cutting stroke speed, so that fast return stroke speed can be used to save time, regardless of what the cutting stroke speed may be.

This new Rockford Openside Planer is built with two cross-rail heads and one side head. It has a maximum planing width for the right hand of 60"; the max-

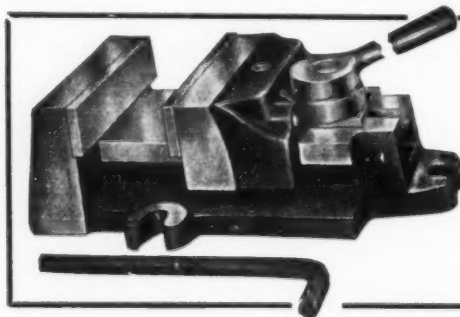


A new hydraulic cylinder assembly design makes this longer stroke size unit possible, and brings to users the advantages of time-saving set-up because of simple, responsive hydraulic valve controls; fine finish and efficient cutting; high speed cutting and return strokes; low operating cost, due to a faster set-up and minimum machine time per job.

A unique feature of the machine is the fact that the speed of the return stroke

imum planing width, including the use of the left hand head is 72"; the maximum distance of table to rail is 72".

Rockford Hy-Draulic Planers are built in both Openside and Double-Housing design. The two massive columns of the Double-Housing Planer give maximum support to the cross-rail tool heads, essential in heavy duty planer work. The single column and cross-rail assembly of the Openside Planer provides rigid sup-



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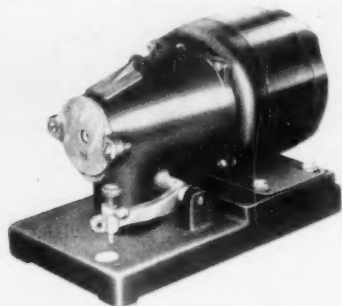
Chicago 12, Ill.

port for the tool heads, and permits overhang set-up work that is wider than the table.

Both types can be supplied with two tool heads for the cross-rail and one tool head for the vertical side rail; the second cross-rail head and the side rail are extra equipment. The Planers are also built in stroke lengths of 10, 12, 14, 16, 18 and 20 feet. **Rockford Machine Tool Co.**, 2537 Kishwaukee St., Rockford, Ill.

NEW HIGH SPEED WIRE STRIPPER

An efficient high-speed wire stripper has recently been placed on the market by the High Speed Hammer Co. This compact unit was designed primarily to put wire stripping on a production basis. The manufacturer states that the device will instantly and completely remove the insulation from the ends of solid, stranded multi-conductor cable or wire up to $\frac{1}{2}$ " in diameter. A positive, easily adjustable stop is provided for any length of stripping up to $1\frac{1}{2}$ ". Even wire to which insulation is firmly affixed is stripped with ease by the High Speed Wire Stripper, according to the makers.

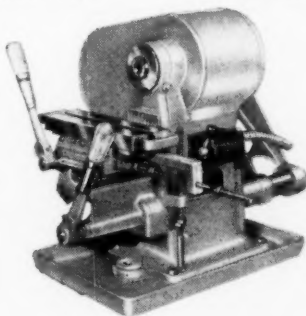


The unit is easily set up for operation; it is built to stand up under years of trouble-free operation. The cutting knives are circular and are made from a special alloy steel. A new cutting edge may be easily obtained by turning the knives slightly. The knives themselves can be quickly and economically replaced, if necessary. All adjustments for length or diameter can be easily and rapidly made.

The machine is direct-connected to the motor; it plugs into any convenient outlet. The standard model, illustrated above, is furnished with a $\frac{1}{4}$ h.p., 110 volt, 60 cycle, single phase motor, with cord, switch and plug. It is made by **High Speed Hammer Co.**, 311 Norton St., Rochester 5, N. Y.

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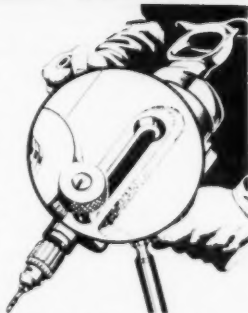
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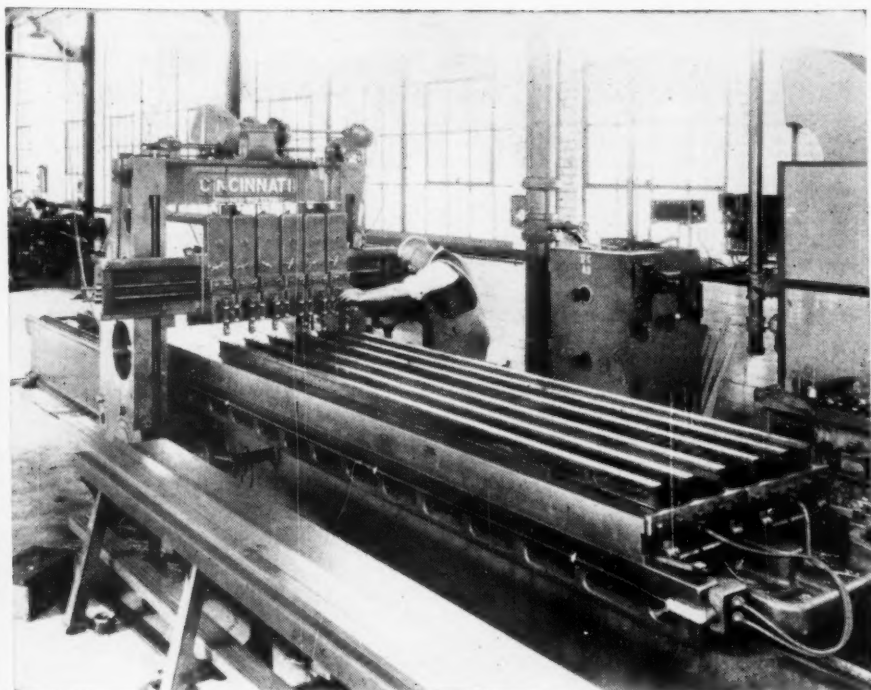


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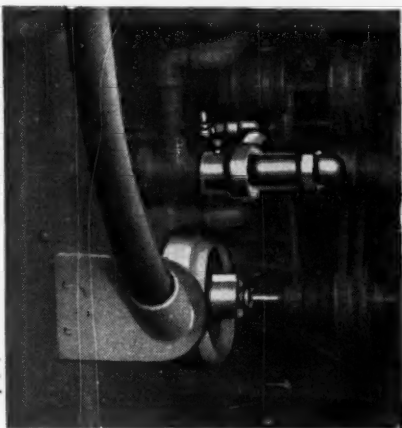
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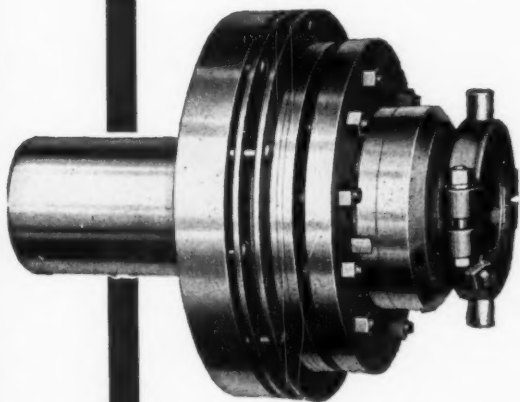
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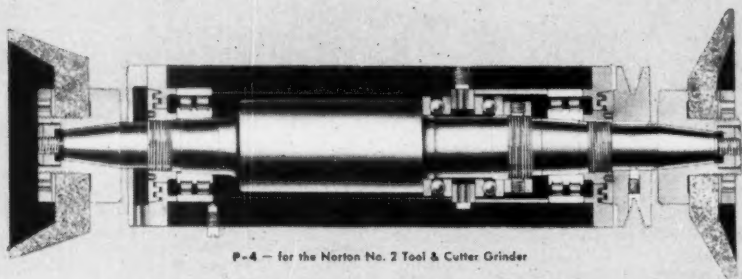
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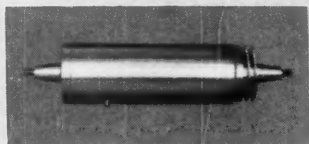
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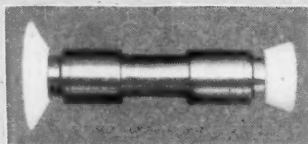
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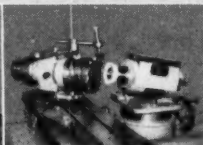
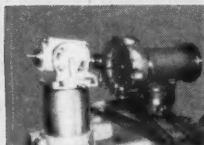
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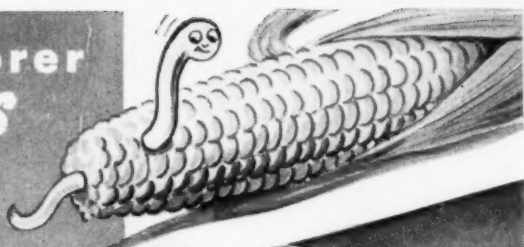
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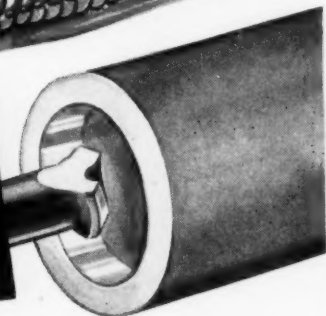
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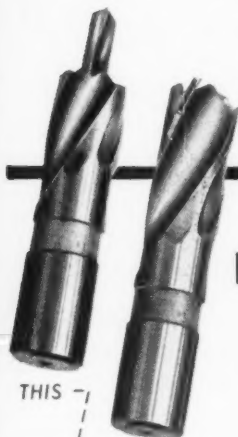
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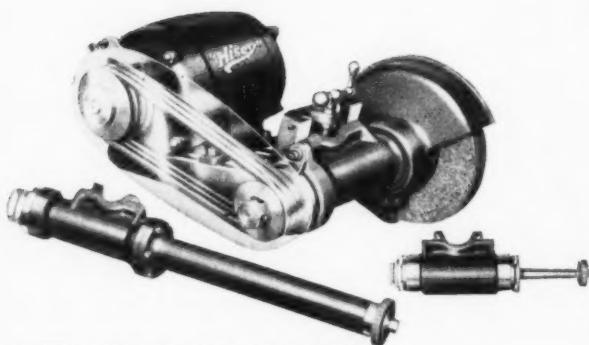
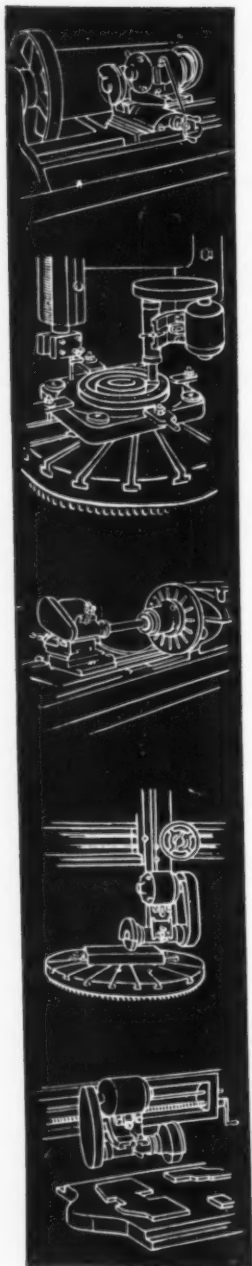


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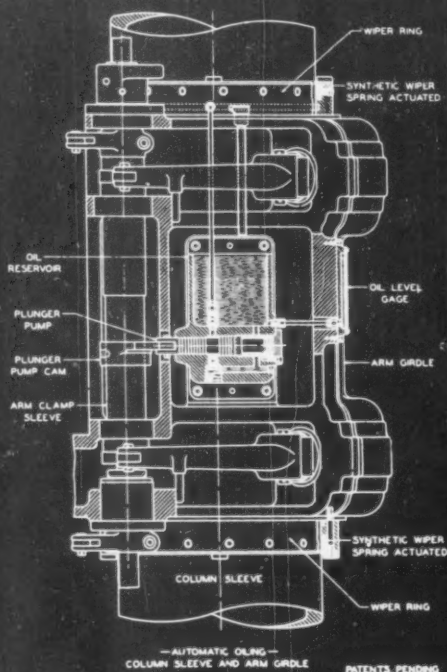
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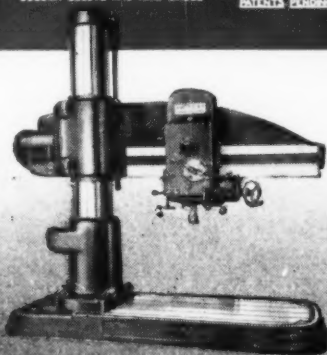


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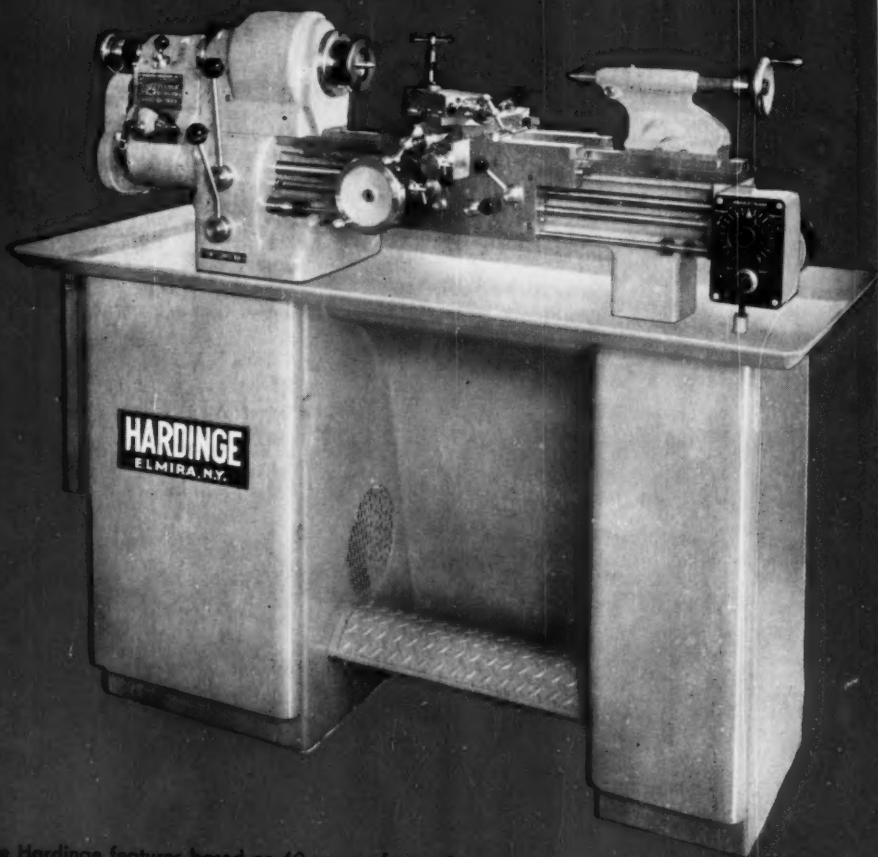
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